

UNIVERSITY OF KWAZULU-NATAL

**Integrated Water Resources Management and
the Manufactured Scarcity of Water in Africa**

by

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Abstract

The African version of the neo-liberal system known as Integrated Water Resources Management (IWRM) has had especially dubious results in Ghana, Malawi and South Africa. Two factors – cost recovery and decentralisation of responsibilities without resources – are the primary means by which the poor are financially squeezed, in a manner not unlike other neo-liberal strategies in development policy and projects. The IWRM framework was accepted as best practice during the Rio de Janeiro Earth Summit of 1992 (and included as chapter 18 of Local Agenda 20), integrated into the 1992 International Conference on Water and Environment (commonly known as Dublin Principles), and taken forward in the Johannesburg Plan of Implementation during the World Summit on Sustainable Development of 2002. Since then, many countries that agreed at the WSSD to formulate IWRM policies by 2005 have begun to do so.

IWRM quickly became the favoured strategic approach of development agencies, international financial institutions, donors, state water officials and some NGOs. Civil society has had uneven engagements with IWRM. An important early critique emerged from Ghanaian civil society, during the early 2000s, when IWRM led to commercialisation and even privatisation of water in urban areas. There was growing concern about excessive cost-recovery and self-management of water in rural areas without the benefit of state subsidies. Water commodification and decentralisation – meaning in practice, fewer resources and more responsibilities for lower tiers of government – also emerged as a problem elsewhere on the continent, where governments are abdicating their responsibilities to supply water and sanitation using the rubric of IWRM.

Using household interviews and focus group discussions in the Densu area of Ghana, in the Balaka, Ntcheu and Mangochi areas of Malawi, and in areas of Durban, South Africa where Urine Diversion toilets were supplied to rural and peri-urban households, and basing my analysis on framings provided in theories of water and sanitation governance, new institutional economics and environmental economics, I conclude that implementation of IWRM results in a ‘manufactured scarcity’ of water in rural Africa. The reforms required are extensive, and civil society has only begun to make an impact with its own vision: moving from manufactured scarcity to genuine abundance.

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List of Acronyms

ADF	African Development Fund
ADRA	Adventist Development and Relief Agency
AEO	African Economic Outlook
AfDB	African Development Bank
Afrisan	Africa Sanitation Conference
AFW	Africa Water Facility
ALA	Accra Learning Alliance
AMA	Accra Metropolitan Area
AMC	Accra Metropolitan Council
AMCOW	African Ministerial Council on Water
ANC	African National Congress
APF	African Partnership Forum
ARI	Agricultural Research Institute
ASIP	Accra Sewerage Improvement Project
ASP	Accra Sanitation Project
ATA	AmaQadi Traditional Authority
AVRL	Aqua Vitens Rand Limited
AWA	African Water Association
AWV	Africa Water Vision
BAATs	Best Appropriate Affordable Technologies
BCA	British Colonial Division
BDA	Balaka District Assembly
BDH	Balaka District Hospital
BOT	Build, Operate and Transfer
BWB	Blantyre Water Board
CAWP	Coalition Against Water Privatisation
CBA	Cost Benefit Analysis
CBM	Community Based Management
CC	Cape Coast
CCAP	Church of Central Africa, Presbyterian
CEO	Chief Executive Officer
CIDA	Canadian International Development Agency
CMA	Catchment Management Agency
CMF	Catchment Management Forum
COMWASH	Community Water, Sanitation and Health Project
CONIWAS	Coalition of NGOs in Water and Sanitation
CPAR	Canadian Physicians for Aid and Relief
CSA	Community Service Agents
CSC	Community Score Card
CSIR	Council for Scientific and Industrial Research
CSP	Country Strategy Papers
CVT	Constant Volumetric Tariffs
CWB	Central Water Board
CWSA	Community Water and Sanitation Agency

CWSP	Community Water and Sanitation Programme
DA	District Assembly
DA	Democratic Alliance
DACF	District Assembly Common Fund
DANIDA	Danish international Development Agency
DBO	Densu Basin Office
DBSA	Development Bank of Southern Africa
DBT	Decreasing Block Tariffs
DCCD	Department of Cooperatives and Community Development
DCD	District Coordinating Director
DDC	District Development Committee
DDWRA	Densu Delta Water Resources Area
DEA	Department of Environmental Affairs
DFID	Department for International Development of UK
DHS	Department of Human Settlements
DOE	Department of Environment
DPP	Democratic Progress Party
DRB	Densu River Basin
DRWS	Department of Rural Water Supply
DSW	Durban Solid Waste
DVRWS	Dutch Vitens Rand Water Services
DWA	Department of Water Affairs
DWO	District Water Officer
DWS	Department of Water and Sanitation
DWSS	Drinking Water and Sanitation Sector
DWSTs	District Water and Sanitation Teams
DWWF	Dublin World Water Forum
EC	European Commission
ECA	Economic Commission for Africa
ECL	English Common Law
ECOWAS	The Economic Community of West African States
EE	Environmental Economics
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EM	Ethekwini Municipality
EMA	Environmental Management Act
EPA	Environmental Protection Agency
ESP	Environmental Sanitation Policy
EUWI	European Union Water Initiative
FAO	Food and Agricultural Organisation
FC	Forestry Commission
FCT	Fixed Charged Tariffs
FOE	Friends of the Earth
GACMC	Greater Accra City Metropolitan Council
GAMA	Greater Accra Metropolitan Area
GAMC	Greater Accra Municipal Council

GDP	Gross Domestic Product
GFT	Gold Fields Tarkwa
GHS	Ghana Health Service
GIDA	Ghana Irrigation Development Authority
GTZ	Deutsche Gesellschaft Fur Technische Zusammenarbeit
GWCL	Ghana Water Company Limited
GWP	Global Water Partnership
GWSC	Ghana Water and Sewerage Company
GWSC	Ghana Water Sewerage Corporation
HDI	Human Development Index
HIS	Integrated Household Survey
HMC	Hague Ministerial Conference
HSC	Handbook on Stakeholder Consultation
HSD	Hydrological Services Division
IAB	Institute for Aquatic Biology
IBT	Increasing Block Tariffs
ICWE	International Conference on Water and Environment
IDA	International Development Agency
IDA	Irrigation Development Authority
IDB	Inter-American Development Bank
IFP	Inkatha Freedom Party
ISDs	Institutional Support Developers
ISODEC	Integrated Social Development Centre
IWA	International Water Association
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Programme
JPCC	Joint Permanent Commission of Cooperation
JPI	Johannesburg Plan of Implementation
JSB	Joint Services Board
KfW	Kredietanstalt Fur Wiederaufbau
KVIPL	Kumasi Ventilated Improved Pit Latrine
KZN	KwaZulu-Natal
LA	Local Assembly
LCNGOs	Lesotho Council of Non-Governmental Organisations
LGA	Local Government Act
LGA	Local Government Authority
LWB	Lilongwe Water Board
MAS	Ministry of Agricultural Services
MASAF	Malawi Social Action Fund
MBC	Malawi Broadcasting Corporation
MBWS	Mpira Balaka Water Scheme
MC	Mining Commission
MCP	Malawi Congress Party
MDGs	Millennium Development Goals
MDGS	Malawi Growth and Development Strategy

MEC	Member of the Executive Council
MEJN	Malawi Economic Justice Network
MEPD	Ministry of Economic Planning and Development
MEST	Ministry of Environment, Science and Technology
MHPWWR	Ministry of Housing, Public Works and Water Resources
MIWD	Ministry of Irrigation and Water Development
MLGRD	Ministry of Local Government and Rural Development
MME	Ministry of Mines and Energy
MNR	Ministry for Natural Resources
MOFA	Ministry of Food and Agriculture
MPP	Member of Provincial Parliament
MPs	Members of Parliament
MSD	Meteorological Service Department
MTC	Ministry of Transport and Communication
MWA	Mpira Water Authority
MWA	Ministry of Water Affairs
MWD	Ministry of Water Development
MWSS	Mpira Water Supply Scheme
NCWSP	National Community Water and Sanitation Programme
NDF	Nordic Development Fund
NDPC	National Developing Planning Committee
NEAP	National Environmental Action Plan
NEP	National Environmental Policy
NEPAD	New Partnership for Africa's Development
NGOs	Non-governmental Organisations
NHC	National House of Chiefs
NIE	New Institutional Economics Theory
NIPDS	National Irrigation Policy and Development
NJM	New Juaben Municipal Assembly
NNP	Net National Product
NSO	National Statistics Office
NSP	National Sanitation Policy
NTF	Nigerian Trust Fund
NWB	Northern Water Board
NWIM	National Water implementation Manual
NWP	National Water Policy
NWRA	National Water Resources Authority
OECD	Organisation for Economic Cooperation and Development
OED	Operations Evaluation Department
OPT	Output Based Tariffs
PBMPs	Best Management Practices
PP	People's Party
PPA	Public Procurement Act
PPE	Pro-Poor Expenditure
PPIAF	Public-Private Infrastructure Advisory Facility
PRSP	Poverty Reduction Strategy Paper

PSC	Project Steering Committee
PURC	Public Utilities Regulatory Commission
QDC	Qadi Development Committee
RBA	River Basin Authority
RHAM	Rainwater Harvesting Association of Malawi
RHC	Regional House of Chiefs
RMCs	Regional Member Countries
RWS	Rand Water Services PTY of South Africa
RWSSI	Rural Water Supply and Sanitation Initiative
SADC	Southern African Development Community
SALGA	South African Local Government Association
SAPs	Structural Adjustment Programmes
SAWC	South African Water Caucus
SEA	South East Asia
SIP	Sanitation Improvement Project
SLSA	Sustainable Livelihoods on Southern Africa
SPA	Strategic Partnership with Africa
SRC	Songwe River Commission
SRWB	Southern Regional Water Board
SSA	Sub-Saharan Africa
STA	Sobonakhona Traditional Authority
SZT	Seasonal and Zonal Tariffs
TCE	Transactional Cost Economics
TICAD	Tokyo International Conference on Africa Development
TMA	Tema Metropolitan Area
TMC	Technical Management Committee
UCA	Umnjeni Catchment Area
UD	Urinary Diversion Toilets
UDF	United Democratic Front
UKZN	University of KwaZulu Natal
UN	United Nations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNESCO	United Nations Educational and Science Council
UNICEF	United Nations Children's Fund
UNWC	United Nations Water Conference
VD	Veblenian Dichotomy
VDC	Village Development Committee
VIPs	Ventilated Improved Pit Latrines
VLOM	Village Level Operations and Maintenance
VLTC	Volta Lake Transport Company
VRA	Volta River Authority
VRBA	Volta River Basin Authority
VRWS	Vitens International BV of the Royal Netherlands
VSL	Value of a Statistical Life
WAM	Water Aid Malawi

WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WB	World Bank
WCD	World Commission on Dams
WCs	Water Closets
WCW	World Commission on Water
WDM	Waste Management Department
WDMR	World Development Movement Report
WESNGOs	Water and Environmental Sanitation Network NGOs of
Malawi	
WHO	World Health Organisation
WISA	Water Institute of Southern Africa
WRA	Water Resources Act
WRAB	Water Resources Amendment Bill
WRAs	Water Resources Areas
WRB	Water Resources Bill
WRC	Water Resources Commission
WRC	Water Resources Act
WRC	Water Research Commission
WRCA	Water Resources Commission Act
WRESP	Water Resources and Environmental Sanitation Project
WRI	Water Research Institute
WRII	Water Resources Research Institute
WRS	Water Resources Strategy
WRUs	Water Resources Units
WSA	Water Services Act
WSCAS	Water and Sanitation Country Assistance Strategies
WSG	Water and Sanitation Governance
WSP	Water and Sanitation Programme
WSRS	Water Sector Restructuring Secretariat
WSS	Water Supply and Sanitation
WSSD	World Summit on Sustainable Development
WSSSF	Water Supply and Sanitation Sector Financing
WST	Water and Sanitation Teams
WTO	World Trade Organisation
WUAs	Water User Associations
WWA	Water Works Act
WWC	World Water Council
WWDR	World Water Development Report
WWF	World Water Forum
WWTP	Waste Water Treatment Plant
ZAMCOM	Zambezi Watercourse Commission

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Chapter One

Introduction

1. 1 Introduction

In 2000 the African Development Bank (AfDB) adopted Integrated Water Resources Management (IWRM) policy as one of the conditions for funding water supply, sanitation and water resource development projects in Africa (Ginidza, 2007, Rakotobe, 2009). This heralded the continent's entry into a global narrative of water commodification first endorsed at the Rio Earth Summit and the Dublin World Water Forum in 1992. IWRM then spread across the world and indeed most donor partners in Africa subsequently required that countries applying for water-related funding develop IWRM plans. But contrary to stated intent, in Ghana, Malawi and South Africa, the adoption of IWRM plans and policies during the 2000s resulted in the perpetuation of water *scarcity* in terms of access by poor people. Tracking this history, this thesis argues that scarcity of water and sanitation is sometimes not a natural condition, but instead a social construct, one manufactured by multilateral agreements (Shiva, 2002), institutional economic relations, and water and sanitation "governance" under the rubric of IWRM. In many cases, the scarcity construct in turn invokes neo-liberal water-pricing and distributional arrangements, even where this is unnecessary in hydrological respects and inappropriate in terms of social, health and environmental policy.

In this introductory chapter, the background and outline of the research problem is considered. IWRM is located in an African context of under-developed water infrastructure and very low payment capacities. The various views of the exponents and opponents of IWRM are presented with an emphasis on household-level water-supply and sanitation. The chapter begins with a preliminary literature review, and then covers my rationale for choosing the topic and sites, global water governance trends, and African case studies in IWRM. The research questions and the theoretical groundings are explained, along with the research methodology. The chapter concludes with the presentation of the structure of the thesis.

1.2 Background and outline of research problem

IWRM has been defined by the Global Water Partnership (GWP) as “a process that promotes the coordinated management and development of water, earth, and related resources in order to maximise the social and economic benefits that will result in an equitable manner, without compromising the sustainability of vital ecosystems” (de Moran and Ballesteros, 2003:5, GWP, 2003:1). The implementation of IWRM in water supply and sanitation should be characterised by sustainable development in all stages of the water cycle (Maganga, Butterworth and Moriarty, 2002:923, Moriarty, Butterworth and Batchelor, 2004:10). Of course, terms such as “coordinated management”, “sustainability of vital ecosystems” and “sustainable development” are contested, as observed in my case material.

The IWRM framework was accepted as best practice during the Rio de Janeiro Earth Summit of 1992 (and included as Chapter 18 of Local Agenda 21), and integrated into the Dublin principles of 1992, which were taken forward in the Johannesburg Plan of Implementation during the World Summit on Sustainable Development (WSSD) of 2002 (Lenton and Muller, 2009:6: UNHABITAT, 2008:22). The specific Principles of IWRM were developed during the 1992 International Conference on Water and Environment and are commonly known as Dublin Principles (Lenton and Muller, 2009:6). The International Conference on Water and the Environment (ICWE) that took place in Dublin, Ireland on 26-31 January 1992 was attended by experts drawn from governments, international, intergovernmental and NGOs. Unlike the Earth Summit of 1992 that was attended by 135 heads of states, 150 states and 45,000 participants drawn from various sectors, the Dublin Conference was a conference of experts and not a UN conference. Yet its outcomes were enormously significant for IWRM. At the WSSD in 2002, many countries adopted the resolution to formulate IWRM policies by 2005, and began to do so. IWRM quickly became the favoured strategic approach of development agencies, international financial institutions, donors, state officials and some establishment-linked NGOs during the 1990s-2000s. IWRM policies are generally understood as the following (UN HABITAT, 2008:8):

- (i) Fresh water is a finite and vulnerable resource, and one that is essential to sustain life, development and the environment;
- (ii) Water development and management should be based on a participatory approach involving users, planners and policy-makers at all levels;
- (iii) Women play a central role in the provision, management and safeguarding of water;
- (iv) Water has an economic value in all its competing uses and should be recognised as an economic good.

The latter is the most controversial of the principles, and has often been contested in applications across the world, especially commercialisation and privatisation of retail water services. In addition to the Dublin Principles of 1992, IWRM has been endorsed in the Hague Ministerial Declaration of 1998, the UN Millennium Assembly of 2000, the Bonn 2000 Ministerial Declaration, the Johannesburg Plan of Implementation of 2002, the World Water Forum Ministerial Declaration of Kyoto in 2003, Mexico City's 4th World Water Forum Ministerial Declaration of 2006, the Istanbul 5th World Water Forum Ministerial Declaration (2009) and the latest Marseilles 6th World Water Forum (2012). The latest IWRM principles include more advanced implementation advice:

1. Water source and catchment conservation and protection are essential.
2. Water allocation should be between stakeholders within a national framework.
3. Management needs to be taken care of at the lowest appropriate levels.
4. Capacity building is the key to sustainability.
5. Involvement of all stakeholders is required.
6. Efficient water use is essential and often an important source in itself.
7. Water should be treated as having economic and social value.
8. Striking a gender balance is essential.

The seventh of these principles reflected the backlash against the earlier orientation to water as primarily an "economic good". For example a critique had emerged from influential water activists in Ghana during the early 2000s, focused on the IWRM's

implicit and sometimes explicit commercialisation and privatisation of water in urban areas (Laube, 2007:420). There was growing concern about excessive cost-recovery and self-management of water in rural areas without the benefit of state subsidies (Dezalay and Garth 2002:1-2, Deverill et al, 2002, Vermillion 1997). The critique of water commodification and of “decentralisation” usually meaning a combination of fewer resources available yet with responsibilities mandated to lower tiers of government should be considered across the continent, because many governments are seen as abdicating their responsibilities to supply water and sanitation under the rubric of IWRM. Indeed, the critique this thesis considers is that reliance upon IWRM and the focus on water as an economic good has systematically generated water and sanitation poverty. Three case studies (Ghana, Malawi and South Africa) are examined in the pages below, because each sheds light on different facets of IWRM and its implications for water users.

Studies of water and sanitation poverty typically estimate that more than 1 billion and 2.6 billion people, respectively, lack access to sufficient water and sanitation (UNDP, 2003). The roots of the water and sanitation crisis can be traced to poverty, inequality and unequal power relationships, as well as flawed water management policies that exacerbate scarcity (UNDP, 2006). In many parts of the world, access to water is coming under increasing focus as a crucial ingredient in economic advancement, and efforts are being made to understand the limiting factors impeding sustainable development. The majority of people without access to adequate water services live in Asia, while Sub-Saharan Africa has the highest proportion of people without water (UNDP, 2008:6).

It is increasingly the rural areas and urban fringes that will experience shortages of water and sanitation services. As broad coverage increases, it is increasingly the poor, and disproportionately the women and children, who fall into the gaps between urban water and sanitation programmes (UNICEF, 2006). The critical question is: why are the poor, especially those in rural areas, typically left out? Almost two in three people who lack access to clean water are those who are forced to survive on less than \$2 a day, with one in three living on less than \$1 a day. More than 660 million people without sanitation live on less than \$2 a day, and more than 385 million on less than \$1 a day (UNDP, 2006:16).

Proponents claim that if IWRM were successfully applied, the end result would be sustainable water resource management and effective service to the poor (Lloyd, McCarron and Stacey, 2006:19). In addressing water and sanitation poverty, various donors have conditionally adopted IWRM as policy for the support they provide. The main donors and lenders in Africa that have adopted the IWRM framework are the World Bank, the African Development Bank and the UK Department for International Development (DFID). Studies of the rural-urban water and sanitation divide in Africa shed light on the link between IWRM and sustainable development, poverty, governance at the lowest level possible, integrated planning and equitable distribution. To this end, this thesis addresses the question of whether IWRM has lessened or increased water and sanitation poverty in rural Africa.

According to the United Nations, some countries in Africa including Senegal, Uganda, Ethiopia, Zambia, Malawi and Mozambique have managed to reduce water and sanitation poverty through improved coordination of their programmes in various levels of government, adoption of IWRM policies at national and sub-national levels, and improvement in water governance (UNDP, 2008). Where problems remain, the human-induced causes of rural water and sanitation poverty are said to include inappropriate governance and institutional arrangements, lack of water efficiency and failure to harness sufficient water resources for economic development (Mwangi, 2008:6-8).

By the turn of the 21st century, some countries were making progress in expanding access. In Ghana, the total coverage of water in the urban population reached 70% usually defined as having a clean water source within 100 metres although rural areas lagged behind at 42%. The rural water schemes include boreholes, hand-dug wells (with or without hand pumps), impoundments, rain-water harvesting and rural piped schemes. The operation and maintenance of the water facilities are managed by rural communities, whereas in urban areas the management is undertaken by metropolitan or district councils. An estimated 58% of the urban and 29% of the rural population have access to at least minimal household sanitation facilities, mostly ventilated improved pit latrines (VIPs) and septic tanks in their homes. Waterborne sewerage networks exist in the

wealthier parts of major urban centres such as Accra, Tema, Kumasi, Takoradi, Akosombo and Obuasi (ADF, 2005:2).

Strategies employed to address water and sanitation problems differ between urban and rural settlements due to the former's greater geographical density (hence supply efficiency) and higher levels of affordability (with effective-demand deficiency characterising rural areas). In Malawi, the rural target standard of safe water is an average of 27 litres/capita/day (lcd) within a maximum distance of 500m, whereas in urban areas the standard and the target is to provide each household with individual metered connections and nearby standpipes for those that cannot afford house connections (ADF, 1999:7; Njalam'mano, 2007). The implementation of an IWRM approach to rural-urban water allocation arrangements seeks to ensure that there is equitable allocation between rural and urban dwellers as well as ensuring gender sensitivity (ADF, 2005:3).

As for other aspects of hydro-social relations, the IWRM approach to water supply and the sanitation sector tends to pay lip service to aspects of the domestic water cycle such as water treatment, health and hygiene education. In areas where a high prevalence of waterborne diseases is reported, the issue is not just lack of sanitation facilities, but lack of health and hygiene promotion. The classic domestic water cycle has the following stages: abstraction, water treatment, supply to households and, where waterborne sewage exists, removal from the household through sewers, wastewater treatment and discharge to a water body. These critical elements of the water cycle, ensure sufficient quality and quantity, reliability and waste water treatment and discharge (Maganga, Butterworth and Moriarty, 2002:923, Moriarty, Butterworth and Batchelor, 2004:10).

Due to a lack of attention to these factors as well as problems of affordability, implementation of IWRM can result in inappropriate governance and institutional arrangements, the poor paying more than the rich, inequalities in distribution of wealth, commodification and commercialisation, privatisation and self-management by the poor (in cases where there is lack of state subsidies), and decentralisation of fewer resources to lower tiers of government, with states abdicating their responsibilities to provide basic

services (Lloyd, McCarron and Stacey, 2006:27; Moriarty, Butterworth and Bachelor, 2004:10). The question the thesis addresses is whether implementation of IWRM reduces water and sanitation poverty or perpetuates it (IWRM, Dublin Principles, 1992).

1.3 Preliminary literature review

Since the early 2000s, several studies of water and sanitation poverty blame, poor water governance, including selective use of IWRM policies, and poorly-managed community water management projects (Wright, Muller and Ait-Kadi, 2002, UNDP, 2006, UNDP, 2008). This section reviews global trends and international case studies, while chapter four reviews IWRM debates across Africa.

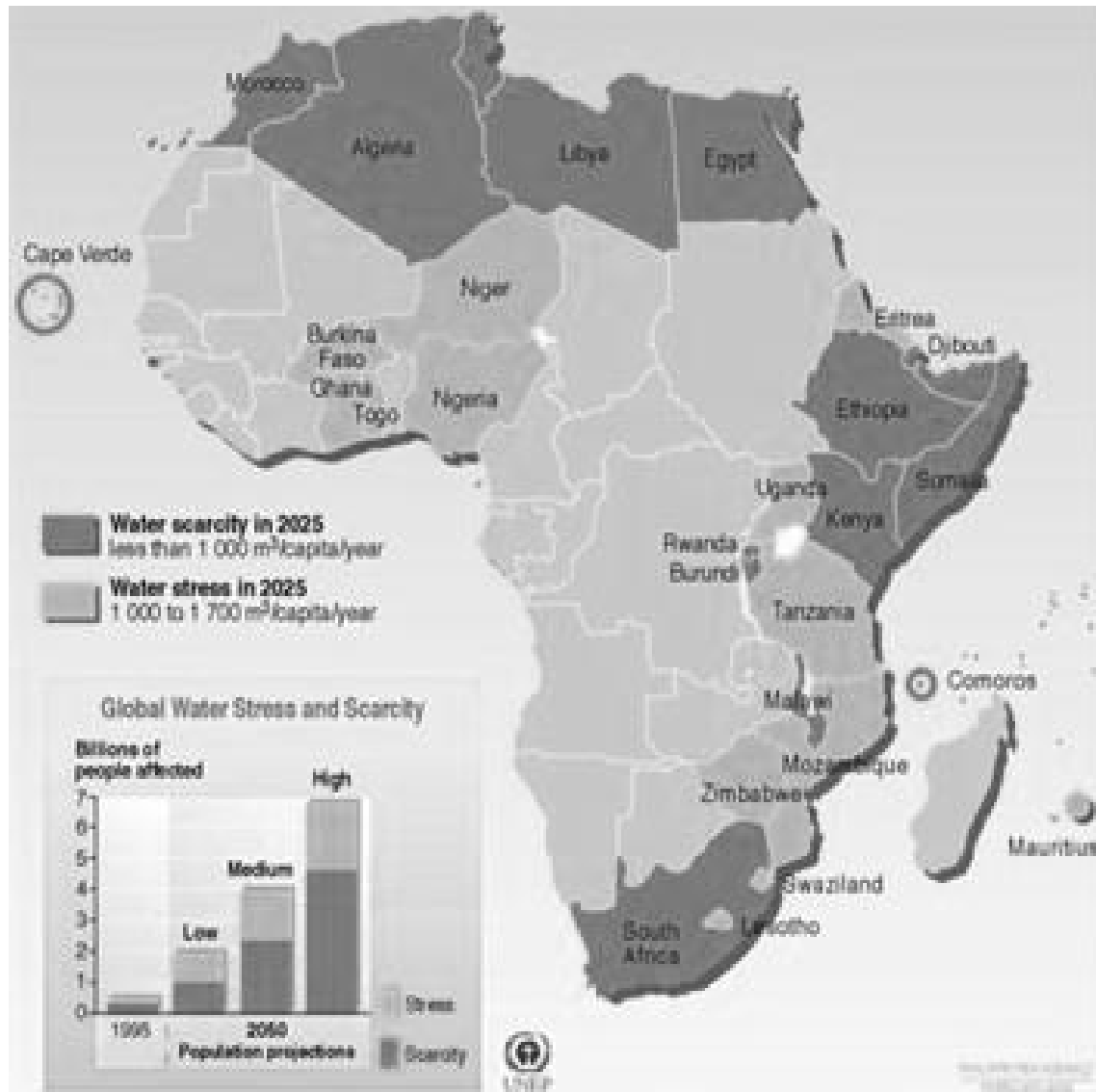
1.3.1 Global trends

In high-income areas of cities in Asia, Latin America and Sub-Saharan Africa people enjoy access to several hundred litres of water per day delivered into their homes at low prices by public utilities. Meanwhile, slum dwellers and poor households in rural areas of the same countries have access to much less than the 20 litres of water per day per person required to meet the most basic human needs. Women and young girls carry a double burden of disadvantage, since they are the ones who sacrifice their time and education to collect water. Much the same applies to water for livelihoods. Across the world agriculture and industry are adjusting to tightening hydrological constraints. But scarcity is not experienced by all. In water stressed parts of India, irrigation pumps extract water from aquifers 24 hours a day for wealthy farmers, while neighbouring smallholders depend on the vagaries of rain (World Water Development Report, 2009, Shiva, 2002).

Here, too, the underlying cause of scarcity in the large majority of cases is institutional and political, not a physical deficiency of supply. Raw bulk water that water utilities sell to service providers (typically municipalities, water companies or even NGOs) is not in short supply in most countries, but lack of affordability leaves the poor systematically excluded from access. They suffer limited legal rights while public policies limit access to infrastructures that provide water for life and for livelihoods. In short, scarcity is manufactured through political processes and institutions that disadvantage the poor.

When it comes to clean water, the pattern in many countries is that the poor get less, pay more and bear the brunt of the human development costs associated with scarcity (UNDP, 2006:11; Cardone and Fonseca, 2003:32).

Figure 1.1: African freshwater scarcity



Source: http://www.grida.no/graphicslib/detail/freshwater-stress-and-scarcity-in-africa-by-2025_4036 date accessed 29 September 2011

To be sure, parts of Africa experience water scarcity (Figure 1). South Africa, the Horn of Africa and most North African countries already experience physical scarcity in selected areas. But most of the rest of Africa is not experiencing physical water scarcity,

notwithstanding droughts. Water and sanitation poverty is not related to the lack of the resource itself, but to “economic water scarcity”: the cost of raising or diverting water from source and providing it in a clean state to end users. And although Africa has recorded fairly rapid GDP growth since 2000, this does not reflect broad-based, redistributive growth, so the continent still has a long way to go to reach the level of low water scarcity that is experienced by North Americans and most countries of Europe, where IWRM is not so focused on cost-recovery and the citizenry is not so low-income.

Economic scarcity is in most instances related to the water governance models that are utilised in a country. In most countries that undergo water reforms, such reforms are based on the internationally promoted paradigm of IWRM. The legal implementation of IWRM, like that of other global legal prescriptions, is enforced through international organisations, loan conditionality, expert consultations, and economic as well as political pressures (Dezalay and Garth 2002: 1-2). In various African countries, including Ghana, reform processes focus on the involvement of beneficiaries in the financing, operation and maintenance of water supply and irrigation infrastructures (Deverill et al. 2002, Vermillion 1997).

Governments often abdicate their electoral mandate and responsibility to provide water and sanitation especially to voiceless rural inhabitants. In urban areas, neo-liberal policies often demand the privatisation of urban water supply systems (Bayliss and Hall, 2000). These reforms are often supported by donor agencies and are part of Structural Adjustment Programmes (SAPs) that cut state subsidies for the water sector (Laube, 2007:420). For urban areas, IWRM means privatisation of water and sanitation, whereas in rural areas it means poor households are responsible for constructing, operating and maintaining water and sanitation facilities without any government assistance.

1.3.2 African case studies in IWRM

The processes by which IWRM creates artificial water scarcity and then water/sanitation poverty can be identified through carrying out detailed studies in diverse locations. The

sites chosen for this research are Densu Delta in Accra, Ghana; Ntcheu, Mangochi and Balaka Town in Malawi; and rural (and peri-urban) areas of Durban, South Africa.

These research sites were chosen on the basis that:

(1) Over 300 million Africans lack access to water supply and sanitation, and it is important to understand the specific circumstances behind this shortfall in diverse settings (Ginindza, 2007).

(2) IWRM water interventions by the AfDB, Africa Water Facility, the Nigerian Trust Fund and the African Development Fund promised to assist the rural communities of Ghana and Malawi, largely so as to prevent high incidences of waterborne diseases such as diarrhoea, cholera and typhoid (Nojiyeza, 2008).

(3) Were they supplied with reliable water and sanitation, rural communities in Ghana, Malawi, South Africa and Africa at large could reduce high health care costs, lessen the long periods of time spent collecting water by women and children, lower absenteeism from school particularly for girls, and raise economic output (Rakotobe, 2008).

In other words, the potential for interventions to improve lives is very high, and the 2000s witnessed enormous hype on behalf of IWRM. If these case study areas were to be considered successful, there would be much greater opportunity for the continent to address water and sanitation poverty. The Secretary General of the Africa Water Association, Sylvian Usher (2008), observed that about 602 million Africans have access to potable water, but that out of 54 countries only 26 will be able to meet the Millennium Development Goals (MDGs) by 2015 (AWA, 2009). The region has lagged behind the rest of the world with respect to achieving the MDGs for water supply and sanitation (Cross, 2006, UNDP, 2006:6). For Africa to meet MDGs for water supply and sanitation, the number of persons served would have to have risen from 350 million in 2006 to 760 million by 2015, yet even then, an estimated 400 million would still lack access (AMCOW, AfDB, World Bank, WSP, 2008: vii, Doe, 2007:1, AfDB, 2006:3).

Three countries provide useful case studies regarding potentials for rolling out water services under the rubric of IWRM. Malawi, ruled as a one-party state until 1994 by the Malawi Congress Party of Dr Kamuzu Banda (Mhone, 1992), still ranks as one of the

world's poorest countries (166 out of 177; World Bank, 2007:1). Malawi missed the 2005 IWRM policy deadline and has to date not adopted nor developed an IWRM plan, sanitation policy and water policy, but there are sufficient aspects of IWRM in place that serve as useful lessons. At the time of writing, the 2012 amendments to the Water Resources Act of 1969 were still before parliament, amidst turbulent internal political processes (AfDB et al., 2006:25, 45, 93, MIWD, 2012, Matonga, 2012).

Ghana is one of the countries that grappled with private sector participation in the water and sanitation sector. Civil society resistance included the establishment of a CSO Coalition against Water Privatisation (Grusky, 2001, ISODEC, 2001). Studies recently undertaken in Ghana highlight serious water shortages in the country. Most people depend on water kiosks and vendors for their livelihood (Doe, 2007:14). In addition, Ghana is one of the countries that adopted IWRM and passed legislation promoting decentralisation and private sector participation in water supply and sanitation (Aryeetey and Ahene, 2008:5, Laube, 2007:420). This is consistent with the broad shift dating to independence, whereby radical programmes of Kwame Nkrumah were by the 1980s replaced by World Bank/IMF-sponsored neoliberalism, initially under a military ruler and then neoliberal democratic governments (Hutchful, 1987).

South Africa is regarded as a model for water and sanitation rights not only in Africa, but globally. The human right to water is recognised in the South African Constitution, Act 108 of 1996, and although sanitation is not explicitly recognised as a right, it is implied in the Constitution's health and environmental rights. The government subsidises both water supply and sanitation delivery, and Durban is a crucial case study for considering subsidiarity (in which implementation occurs at the lowest appropriate scale), pricing and service standards. The roll-out of 90 000 Urinary Diversion (UD) toilets in Durban was subsidised by the municipality, although until mid-2014 when the system changed, communities were expected to operate and maintain their toilets. The case is important for revealing the limits to both municipal and community management common in IWRM implementation, and for unveiling community politics where resistance and

dissatisfaction have together made a difference to municipal policy. Future sanitation policy will hopefully be far less discriminatory along class lines.

Ghana, Malawi and South Africa were selected as case studies on the basis of their very different histories, institutional, economic, social, and civil society contexts. Each case represents different aspects of the IWRM process. Each has different water challenges, and different degrees of implementation of IWRM principles. That is, these countries differ significantly in almost every contemporary and historical indicator across the social, political and economic fields. Thus they provided an opportunity to explore which features of IWRM and water and sanitation governance tend to re-appear, independent of context. The two common denominators, in all the case studies are that the state prioritised cost saving, and decentralised water and sanitation governance (Norman and Bakker, 2008, Cohen, 2011).

In Malawi, the Mpira Balaka Water Scheme project chosen as a case study to illustrate IWRM was implemented before the AfDB adopted IWRM as a policy condition but has since been subjected to decentralisation. The project chosen as a case study in Ghana, the Accra Sanitation Project, was designed and implemented after the adoption of the IWRM policy in 2000, as well as after the implementation of the Rural Water Supply and Sanitation Initiative (RWSSI) which came into effect in 2007. The Accra Sanitation Project is an example of an RWSSI project and one of the first efforts of the AfDB to operationalize the IWRM approach. The Durban UD project was implemented in the late 2000s after Ventilated Improved Pit-latrines (VIP) strategies failed due to rapid filling-up of toilet pits, leading to public health threats, but by mid-2014 the UDs suffered the same fate.

1.4. Research problems and objectives

1.4.1 Objectives of this thesis

The broad objective of this thesis is to examine water and sanitation governance, new institutional economics and environmental economics as applied to the implementation of

IWRM. The focus on water governance requires consideration of collective action. Water and sanitation governance is linked to institutional mechanisms; property rights (private property vs. public property) whether provision is public or private; institutional price setting; the extent of decentralization or centralisation and the role of market mechanisms (Kuks, 2004:13, Wunsch, 2001, Indranil, 2010, Franks, 2004, Batterbury and Fernando, 2006, Castro 2007, Oxhorn, Tulehin and Selee, 2004).

The focus on new institutional economics means that consideration of transaction costs, institutional evolution, constitutional choice, collective action, information costs, law and economics of contracts, institutional transaction costs and how the theory of institutions could be utilised to analyse water governance and institutional frameworks (Richter, 2003, Saleth, 2003, North, 1990, Miller, 2003, Saleth and Dinar, 2003, Klein, 1999, Williamson, 1999, Williamson 1995, Furubotn and Richter, Feige, 1990, Fiani, 2004, Streeck and Thelen, 2006, Selznick, 1996).

The focus on environmental economics is based on IWRM claims of eco-efficiency; environmental performance; sustainability; physical scarcity and economic scarcity; and externalities as either benefits or losses associated with a water governance model and an institutional framework (Massarutto, 2008, Asafu-Adjaye, 2000, Schaltegger and Synnestvedt, 2002).

1.4.1 Specific research questions

The research questions are based on the link between water and sanitation governance, new institutional economics and environmental economics. The analysis of IWRM requires the investigation of the water and sanitation governance framework. The level of analysis is complemented by the mapping of institutions and institutional framework adopted as a result of IWRM. Environmental economics is relevant to the analysis of pollution abatement issues, sustainable development and externalities, and thus compliments the other two theoretical frameworks. For the purpose of this study, all three theoretical frameworks complement each other and assist with the analysis of IWRM implementation. This study is unique in terms of linking three frames of analysis which

best contribute in analysing governance, institutions and environmental management which are key elements found in IWRM platforms.

The main research question is whether the implementation of IWRM reduces or perpetuates water and sanitation poverty, by recognizing water as an economic good and by promoting decentralisation governance models. In order to answer this broad question the following five sub-questions were posed:

- “What is the main institutional shift in water and sanitation governance that can be perceived in Africa as a result of the introduction of IWRM?” In this question I am expecting an elaboration on the new institutions, laws and policies that were established and promulgated as a result of the introduction of IWRM in Africa.
- “To make water and sanitation governance more coherent, what are the institutional mechanisms, property rights, service provision strategies (public or private), degree of centralisation or decentralisation, and market mechanisms chosen?” Through this question I expect a robust discussion about state centred and private sector centred development on the one hand and subsidiarity and markets on the other hand.
- “How can these water governance instruments be explained in terms of institutional conditions under which they operate?” I am expecting changes in institutional focus as a result of donor influence to be different in areas where development is driven by Africans themselves.
- “What transaction costs, institutional evolution, constitutional choice, collective action, information costs, law and economics of contracts and institutional transaction costs could be associated with the introduction of IWRM in AfDB supported water and sanitation projects?” I expect further elaboration on cost reflexivity, water rights enshrined in constitutions and various actions taken by communities to deal with market forces.
- “What eco-efficiency, environmental performance, physical scarcity and economic scarcity trends, sustainability variables and externalities, are associated with the introduction of IWRM in Africa and elsewhere?” This final question is probing

respondents on various pollution abatement strategies adopted as a result of the introduction of IWRM in Africa.

Once these questions are addressed in a structured manner, using the three case study sites, it will be possible to generate an answer as to whether IWRM is performing to expectations and its proponent's claims.

1.4.2 Broader issues investigated

The investigation of the causes of water and sanitation poverty in rural areas of Africa using RWSSI funded through AfDB was undertaken against the backdrop that many financial commitments have been made. Rural specific schemes using the IWRM were adopted by UN member states, yet rural water and sanitation poverty continues to increase (UNDP, 2006, WWDR, 2009). Debate rages about whether countries that adopt IWRM principles (as most did in 2002 during the WSSD) gain improved rural water and sanitation and anti-poverty outcomes (e.g. in relation to tariff systems), than those with different water governance systems. The AfDB is responsible for advising member countries in developing IWRM plans. The study will contribute to the existing body of knowledge, which argues that IWRM as a well recognised water governance model has so far failed to alleviate water poverty in Africa and developing countries. Another contribution of this study is making links among water and sanitation governance, new institutional economics and environmental economics. Applying these to the implementation of IWRM in Africa will address the shortcomings of neo-classical economics, which separates water and sanitation governance from institutional economics and environmental economics (Kuks, 2004, Schaltegger and Synnestvedt, 2002, Saleth, 2003, Saleth and Dinar, 2004, Williamson, 1995).

1.5 Principal theories

In the process of examining which theories could be best applied to evaluate the usefulness of IWRM in Ghana, Malawi and South Africa, these factors were considered:

Water and Sanitation Governance: This theory deals with the making and implementation of rules and the exercise of power through institutional mechanisms. In the water and sanitation sector, governance theory was applied to assess whether the AfDB funded projects are implemented by a Ministry Responsible for Water and Sanitation, a Water and Sanitation Municipality Department, a Water and Sanitation Utility or Water Board, a private operator, a water authority such as Mpira Water Authority in Malawi or an NGO. Identifying the institutional power relations assists in understanding the degree of (Keohane, 2002:2) decentralisation or centralisation and associated property rights and market mechanisms which either reduce or increase rural water and sanitation poverty (Saleth, 2004, Williamson, 1998, Livingston, 2005, Saravanan, McDonald and Mollinga, 2008, Saleth and Dinar, 2003).

New Institutional Economics (NIE): The evolution and promotion of IWRM can also be viewed with the aid of categories such as poverty and sustainability, risk promotion, the policy perspective and its practice in the sector. These are captured in the New Institutional Economics of Williamson (2000), whose focus has been on Integrated Planning, Governance and Environmental Economics. IWRM is based on integrated planning whereby all stakeholders (agriculture, industry, domestic water users) should agree on water allocations. Water governance therefore needs to be revisited in such a way that the lowest level possible structure is responsible for the management of water resources at each basin level, under the principle of subsidiarity (Lloyd, McCarron and Stacey, 2006). The New Institutional Economics of Williamson is vital to understand how the implementation of IWRM over time began placing more emphasis on market orientation and the economic value of water, above its value as a social good (Saleth and Dinar, 2003, Saleth 2004, Kuks, 2004, Page and Bakker, 2005).

Environmental Economics Theory: The environmental economics theory that the study was based on applies to the roles of private property and market forces in resource management, eco-efficiency, externalities and sustainability (North, 1993, Saleth and Dinar, 2004). The IWRM emphasises “water as an economic good” that should be paid for in full, which undermines the principle that water is also a social good that

governments need to subsidise to ensure access by the rural (and urban) poor (Lloyd, et al, 2006:14). The use of environmental economics theory assists in unpacking the contribution of IWRM to eradicating or perpetuating water and sanitation poverty in rural Africa, through consideration of subsidies, tariffs, and the management of water resources and externalities such as pollution derived from poor sanitation policies. Another practical matter relates to a shift from waterborne sanitation to dry sanitation that came into effect when IWRM became an official policy of the AfDB in 2000. The other critical factor interrogated is whether sustainable development can be derived from AfDB funded projects (Williamson, 1996, Saleth, 2004, Fiani, 2004, Schaltegger and Synnestvedt, 2002, Asafu- Adjaye, 2000).

The three principal frameworks: water and sanitation governance, new institutional economics, and environmental economics theory were used to trace the evolution of IWRM and show how its implementation in various AfDB funded projects reduces or perpetuates water and sanitation poverty in the rural areas of Ghana and Malawi as well as Durban, South Africa. The theories helped establish a focus of this research thesis within two central principles of IWRM: subsidiarity and cost-reflexivity. In the first category, management needs to be taken care of at the lowest appropriate levels, and in the second, water should be treated as having economic and social value. The inappropriate application of these two principles, are, this thesis argues, responsible for extensive system breakdown in Africa, resulting in rural water and sanitation drought in many cases. (Even in wealthy Durban, which in mid-2014 won the Stockholm Industry Water Award, the breakdown of UD cost-recovery and decentralisation strategies led to a dramatic revision of the IWRM strategy, with a resulting new state intervention to empty UD toilets as a result of public health threats.) The thesis reflects on the implementation of IWRM principles using AfDB funded projects as case studies as well as the self-funded Durban case. There are profound challenges for implementation of IWRM especially in rural areas where poverty is rife (UNHABITAT, 2008:22: Nottawasaga Institute, 2009:10), but also in one of the continent's wealthiest metropolitan governments. These challenges follow from the principles themselves, not just from implementation inefficiencies.

The major challenge for IWRM lies in determining the procedures and practical tools for establishing a common understanding of the causes of water-related problems, and agreement on steps to overcome these problems, as a vital component of the IWRM framework. The IWRM toolbox developed by the Global Water Partnership (GWP) in 2004 includes decentralisation-devolution, public-private partnerships, the use of pricing to help drive efficiency, and the use of other market mechanisms, including domestic trade in water in some instances. What is lacking in the GWP toolbox is integrated problem identification and domain definition, lack of applicability of the tools in country contexts (especially rural areas), complicated procedures, the long-term nature of IWRM and IWRM's failure to address immediate problems. The other dilemma in translating IWRM principles is that they are well suited to river basin initiatives, but not to water and sanitation projects. The focus is on water infrastructure shared at a basin level by various countries, leaving gaps in terms of the diversity of riparian states and actors, different country policies and governance set ups (UNHABITAT, 2008:22).

The research is premised on the assumption that IWRM, just like any other water governance model, has strengths and weaknesses. This is borne out by the literature to date. The report by Nottawasaga Institute (2009) entitled "Analysis of Water and Sanitation Policies and Status of IWRM in Africa" reflects progress made in adopting IWRM principles in 17 countries (Zambia, Mozambique, Lesotho, Botswana, Tchad, Cameroon, DRC, Senegal, Ghana, Burkina Faso, Mali, Nigeria, Kenya, Tanzania, Uganda, Ethiopia and Rwanda). It provides quantitative assessments of countrywide achievements of the MDG targets related to access to safe water and improved sanitation, and suggests modification of water and sanitation sectoral plans to attain IWRM principles. The report assesses water and sanitation budgets at the state levels and reviews local IWRM river basin initiatives such as the Densu River Basin in Ghana and Lower Manyame Sub-catchment in Zimbabwe.

However, the Nottawasaga Intitute (2009) takes for granted the IWRM principle of recognising water as an economic good, including privatisation and decentralisation,

without considering state-centric models of linking water and sanitation delivery that require more active national oversight and greater subsidies. The water sector reforms undertaken in most countries tend to focus on setting up structures, but little emphasis is placed on the impact on the poor in terms of access to services and the role of the state in driving development. A great deal of money has been committed to the water sector, but there has been little or no impact, especially in rural areas. The number of institutions established in Ghana, Malawi and South Africa including funds committed to IWRM is illustrated in case studies.

1.6. Research methodology and methods

The study was conducted using a qualitative approach with critical theory informing the broad parameters of analysis, and elements of co-constructing knowledge with various study participants. The methods, paradigms and ontologies, revolved around critical theory and social constructivist approaches. Interviews were conducted with households and key informants in Accra, Ghana and Balaka, Ntcheu and Mangochi in Malawi as well as rural and peri-urban areas of Durban, South Africa. Focus group discussions were conducted together with household interviews. This section considers the rationale for the methodology, research strategies, target population, sampling strategies used, the research instrument used, interviews, data analysis protocols, validity, reliability, limitations of the study, elimination of bias and ethical considerations.

1.6.1 Rationale for the methodology

The research methodology that was used to collect data included household interviews, focus group interviews, community meetings attendance and key informant interviews. The data collected is qualitative in nature and collecting such data enabled the scope to conduct follow-up interviews, observe various water points together with sanitation facilities and problems that interviewees alluded to. Data collected from households were confirmed in interviews conducted with local government officials, employees of ministries responsible for water, employees of various regulatory authorities and, non-governmental organisations operating in various research sites. Collecting qualitative data also enabled the researcher to link primary data collected with the radio interviews,

statements issued by members of parliament in the media, policy documents and project documents (Gray, 2009:165). Qualitative research approaches allowed the researcher to confirm and refute secondary data in the form of policy documents on IWRM and the reality of providing water and sanitation services to rural households. Participating as an observer in various community meetings, IWRM platforms, meetings of NGOs and other stakeholders such as water user associations (WUAs) and water and sanitation committees (WATSAN) was important. The qualitative research methodology is in line with critical theory, action research and post positivist research paradigms, which is an intricate part of the research philosophy, epistemologies and ontologies that shaped the study (Creswell, 2008:597). A qualitative research approach was chosen to gain a deep, intense and a holistic overview of the context under which water and sanitation services are provided in Africa using IWRM as an approach.

1.6.2 The research strategies

The research design employed in this study included exploratory, theory testing, theory building and evaluation. In the early stages of the research process, efforts were made to establish the most basic criteria before the actual study started. The topic of ‘manufactured scarcity of water and sanitation services’ was arrived at based on a consideration of IWRM’s unintended consequences. There was little existing research on implementation of IWRM in real life settings in South Africa, Ghana and Malawi, especially in fusing the three approaches I had come to understand, theoretically: new institutional economics, water and sanitation governance, and environmental economics. There was no study based on these approaches of water and sanitation services in rural areas of Africa. The study was designed in such a manner that real life settings of IWRM implementation in South Africa, Ghana and Malawi were explored. Finally, the study was designed to evaluate the extent to which AfDB funding is perpetuating water and sanitation scarcity in Africa under the rubric of IWRM (Sarantakos, 2011:11).

The study is based on a social constructivist epistemology which is premised on the view that meaning is constructed and not discovered and therefore subjects construct their own meaning in different ways, even in relation to the same phenomenon (Gray, 2009:18,

Holstein and Gubrium, 2008:14). The different role-players in various IWRM platforms construct their meanings of the role of decentralisation and recognition of water as an economic good within the parameters of allocation and water rights granted to users, such as farmers, communities and other stakeholders. The study is based on post-positivist paradigms of critical inquiry as part of the interpretivism approach. Post-positivism relies on multiple methods as a way of capturing as much of reality as possible (Denzin and Lincoln, 2008:14, Gray, 2009:21). Understanding whether IWRM implementation promotes water and sanitation scarcity in the rural areas of Africa is based on an attempt to understand a social reality grounded in people's experiences of that social reality. This entails finding new meanings of decentralisation and recognition of water as an economic good from the viewpoint of households that are unable to pay for water and sanitation services (Gray, 2009:21).

The meaning is constructed by households that experience restrictions imposed on them by water authorities because they are unable to pay operation and maintenance fees as well as connection fees. The meaning is further constructed by water boards that use their understanding of IWRM to impose water demand management to prevent wastage and promote efficiency and effectiveness. The unit of analysis is the individual research subject, each of whom has a subjective experience of water and sanitation scarcity and a unique understanding of the role of IWRM in promoting such economic scarcity (May, 2002:11, Gray, 2009: 22). Following extensive background analysis of context, the study was conducted using in-depth semi-structured and unstructured interviews as well as focus group discussions, exploring the personal construction of the individual's world. In this sense, reliability is confirmed by participants (May, 2002:11, Gray, 2009:24).

The central assumptions worthy of this research are, to reiterate, that implementation of IWRM is based on decentralisation of responsibilities without sufficient resources ('unfunded mandates'), and that IWRM is one of the most advanced policy frameworks to recognise water as an economic good. It is also premised on the often dubious view that the poor are willing and able to pay for water and sanitation services. The other dominant viewpoint is that governments must facilitate and regulate at a national level,

but they do not necessarily implement water and sanitation projects. Using critical theory, the study offers a different perspective. It questions the currently held values and assumptions that the state should retreat from implementation and instead facilitate an enabling environment for private sector and NGO participation. The dominant view that water is a commodity that is a privilege of those who can afford to pay operation and maintenance costs without any state subsidy is challenged based upon critique coming from existing social structures in several African contexts (Gray, 2009:25).

The view that the poor are willing and able to pay, even if prices are higher in rural areas than urban areas, is a value judgement, one mediated by power relations in society whereby certain groups are privileged over others and exert oppressive force on subordinate groups. This viewpoint, held by donors and neoliberal financial agencies, coincides with the self-interest of dominant institutions such as the AfDB, Africa Water Facility and the World Bank. But beyond the institutional incentive, the view of water as a commodity also perpetuates the reproduction of systems of class, race and gender oppression within which water delivery operates (Gray, 2009:25, Denzin and Lincoln, 2008:18).

There are 54 African members of the AfDB that are potential beneficiaries of the RWSSI. To deepen the understanding of the extent to which the implementation of IWRM as a policy condition promotes rural water and sanitation scarcity in Africa, the strategy adopted is a case study method. The study was conducted in South Africa, Ghana and Malawi where data and reports were gathered, academic and professional literatures were reviewed, and interviews were conducted with households, NGOs, WATSAN committees, WUAs, government officials and other stakeholders. To some extent, participatory action research applies here, insofar as these individuals embarked on collective action to pursue goals of increasing access to water and sanitation either through IWRM platforms or other institutional arrangements (Hennink, Hutter and Bailey, 2011:109).

Various WATSAN Committee members, WUAs, government officials and NGO staff members participated in focus groups discussions that consisted of between six to eight pre-selected participants, lasted for 90 minutes and focused on specific IWRM, water supply and sanitation issues in each case study country (Hennink, et al, 2011:136). In water resources management, the rural poor communities are often oppressed and their access to water and sanitation services is limited. While emancipation and liberation of peasants from oppressive structures that limit their access to water and sanitation cannot be accomplished within the context of a study, the fact that participants co-produced knowledge contributed to various stakeholders re-designing their action plans and beginning to review the various IWRM platforms in a manner that was empowering for ordinary members of civil society (Sarantakos, 2005:44).

1.6.3 Target population

The target population was 13 rural water supply and sanitation projects supported by the AfDB in various member countries as well as low-income rural and peri-urban communities in Durban, South Africa due to the municipal government's role as a model for water and sanitation services. Out of 13 projects implemented since 2002 when the RWSSI was introduced, the Accra Sanitation Improvement Project was chosen because it was conceived when AfDB had already approved IWRM policy as a funding condition in 2000. It is therefore a good example of a project implemented in 2006, six years after the adoption of IWRM as an official policy of the AfDB. In Malawi, Mpira Water Supply Scheme was implemented prior to the adoption of IWRM as a bank policy. The urine diversion (UD) toilets project in Durban is an example of a sanitation project applicable to rural and peri-urban areas. Because the UD's were not funded through AfDB, the project offers a good comparison. It is also important to reflect on similarities and differences of the three projects in perpetuating water and sanitation scarcity. The study was conducted and concluded when two countries (Ghana and Malawi) adopted IWRM plans and began the reforms that were required in the implementation of IWRM. All three case studies were chosen based on differences in their contexts and they all shed light on the practical implications of adopting IWRM.

1.6.4 Sampling

Nearly 200 households participated in the study, drawn from Ntcheu (30), Mangochi (30) and Balaka (40) in Malawi; from Densu Delta area in Ghana (25), and from various areas of Durban, South Africa (70). Five government officials participated in the study from Malawi, and two from Ghana. Regular discussions were held with more than a dozen Durban officials. Other participants included four representatives of NGOs drawn from stakeholders that participate in IWRM platforms in each of the case countries.

Government and NGO participants were chosen using a stratified random sampling strategy. Stratified random sampling is a probability sampling procedure in which the target population is divided into a number of strata, and a sample is drawn from each stratum (Sarantakos, 2011:158). The criterion that was adopted to draw the sample was membership or employment in a water and sanitation NGO, water board or a ministry responsible for water and sanitation. Employees of the AfDB in each country did not participate in the study and instead they recommended staff members from ministries responsible for water and sanitation, NGOs and water boards.

The criteria adopted in drawing a sample of households that participated in the study, was simple random sampling. All households were given an equal chance of being selected (Sarantakos, 2011:154). Their chance of participation depended on their availability and willingness to participate during fieldwork. The nature of the project limited the number of participants in Ghana, for its main focus was the rehabilitation of sanitation infrastructure, which included waste water treatment plants, sewerage and storm water pipes. The IWRM platforms were established to deal with river basin issues and not limited to sanitation, whereas in Malawi the IWRM platforms were targeting WUAs and WATSAN Committees. The various institutions (government ministries, AfDB officials, MPs, Councillors, traditional leaders) were therefore afforded an opportunity to participate in the study so as to reflect on their specific context. Not all the stakeholders that were invited actually participated.

In Durban, 70 participants were drawn from various rural areas. The study adopted qualitative research in seven wards located in South, North and West Durban where UD's were built. The study was conducted at KwaNgcolosi and KwaDinabakubo sections of Ward 9, Embo and KwaNgcolosi areas of Ward 8, Umnini, Magcino, eHlanzeni and Danganya areas of Wards 98 and 99 respectively, Zamani B Section of Ward 91, Mpushini section of Ward 100, and Ngonweni section of Ward 3 (see the map in Chapter 7). These areas are very close to other wards where UD's were built, so they were likely to share common concerns. Interviews were conducted with councillors, project facilitators, members of various technical management committees, members of various project steering committees, ward committees as well as at least ten households selected randomly from each of the above mentioned areas. Interviews were guided by a wide range of questions and discussion was open ended to avoid bias and allow informants to give shape to the information provided.

1.6.5 The research instrument

Data were collected using un-structured and semi-structured interviews. The interview questions addressed water, discrimination, environmental sanitation, hygiene, capacity and willingness to pay, community management and participation aspects of the study. The first section of the interview questions was water-related, including source of drinking water, the proximity of the water source to households, reliability and convenience of the source to households, alternative sources during the dry seasons, quality of the source and the type of water needs that households satisfy using the water source built through AfDB funding.

The second section required households to reflect on discrimination based on their land ownership, indigenous history, disease and gender status. The third section of the interview questions focused on environmental sanitation. The environmental sanitation section focused on the prevalence of open defecation, hygienic and unhygienic practices as well as the availability of public latrines and waste disposal. The fourth section of the interview questions addressed hygiene promotion especially washing hands after defecation and whether soap and water, ash, mud or just water is used. There were also

behavioural questions such as washing hands before eating and broader hygiene improvement associated with projects funded by AfDB in Ghana and Malawi. Other questions in this section dealt with the number of diarrhoeal incidences reported before the introduction of the project and after the project was implemented.

Section 5 of the household research instrument focused on the household's capacity and willingness to pay for water and sanitation services. Questions revolved around whether water and sanitation bills exceeded the household's monthly income, whether they are charged for water, their average monthly instalments, whether they have a metered house connection, whether they pay a flat rate or they pay for the amount that they used. This section also enquired into problems encountered in paying their bills whether for water, latrine, sewerage disposal or garbage collection.

The final section dealt with community participation in various stages of the project cycle, recognition of water and sanitation as fundamental human rights enshrined in each of the country's constitutions and the role of the state and non-state actors in the realisation of this right. The other sub-section of the final section dealt with information dissemination before and after the execution of the project, institutions such as user groups that were established, the nature of decision-making and the extent to which the poor households are involved.

There were also questions for key informants such as NGO staff, government officials and other stakeholders that are knowledgeable about the project but who are not beneficiaries of any of the projects. The key section in this respect concerned school water and sanitation in which questions were provided about the number of toilets available in each school, the number of boy's, girl's and teacher's toilets, as well as hygienic practices associated with toilet usage. Other questions dealt with the ratio of pupils and toilet cubicles, availability of hand washing facilities, cleanliness of the facilities and sources of water available in each school. The section on environmental sanitation dealt with availability and functionality of the sewerage system, waste water treatment plants and disposal of human waste from latrines. Other questions were about

the increase in the number of latrines constructed as a result of the project and hygiene promotion measures undertaken as a result of AfDB project.

An additional section dealt with public participation, consultation and democratic processes associated with the project. Public participation processes dealt with tariff setting and increases, credit control, measures to deal with indigent households implemented by local authorities and whether disconnections are used as a credit control measure. Linked to public participation processes is the sustainability of the projects in terms of operation and maintenance and functionality of water and sanitation facilities. Other aspects of public participation dealt with committee elections, gender aspects of decision-making and dissemination of information by water authorities to households.

In cases where key informants were state and NGO employees, additional questions regarding IWRM platforms were put to them. Questions pertained to the existence of catchment management forums or agencies, the number of stakeholders that are participating, allocation mechanisms amongst various water users, the legal framework governing decentralisation, water abstraction rights and related indigenous perspectives, service provision, regulation, sustainable development, capacity building, tariff system, operation and maintenance, and gender mainstreaming. The key informants were expected to reflect on structures, institutions, laws and allocation of duties and responsibilities that were introduced as a result of the introduction of IWRM in water supply and sanitation.

The mapping questions were not directed to respondents but used as a basis for observation and verification of the data collected. In most instances, questions of a similar nature to the section on households were used as themes in focus group discussion. Members of the WATSAN Committees, WUAs, government officials, and NGO representatives participated in focus group discussions. The purpose of preparing mapping questions was to randomly ask such questions while simultaneously observing concrete aspects such as illegal connections, health and hygiene practices and the functionality of the water and sanitation facilities. In focus group discussions, public

latrine programmes, various health and hygiene campaigns, programmes to encourage the culture of payments, sustainability and public participation programmes were discussed. The focus group discussions consisted of five to eight participants that are knowledgeable on the above themes.

1.6.6 Interviews

Interviews with households that were randomly selected based on their availability covered water, discrimination, environmental sanitation, hygiene, capacity to pay and community management. Each participant was given an informed consent form to fill in and all the ethical issues were dealt with prior to the interview. The interviews were conducted in the homes of the participants. Most interviews lasted for about 30 to 45 minutes. In Ghana, interviews were conducted in English because there are many local languages spoken and it is difficult to find an interpreter in each of the local languages. In Malawi, interviews were conducted in Chewa with translations in English conducted by research assistants. In South Africa, interviews were conducted in IsiZulu with translations conducted in English. The interview questions were based on the research instrument; however, there were follow-up questions that were determined by the nature of the conversation with respondents. Some households were both beneficiaries and members of the WATSAN committees, tap committees and boreholes committees. Attempts were made to give each household an opportunity to be interviewed separately from their fellow borehole committee members and neighbours, but in other instances participants preferred to participate in group interviews.

1.6.7 Focus group discussions

There were six focus group discussions that took place in Malawi. The participants were officials of the Ministry of Irrigation and Water Development, NGOs, Southern Regional Water Board, Water Resources Board, Mpira Water Authority and Balaka District Hospital. In South Africa, four focus group discussions were conducted. The focus group discussions were mainly attended by NGOs, Councillors, municipal employees and civic organisations. In Ghana the focus group discussions were limited to two and it was mainly attended by NGOs. The discussions were based on catchment protection and

related pollution control, decentralisation, privatisation and commercialisation of water and sanitation, community management of water and sanitation projects, capacity building in decentralised institutions, catchment management forums and agencies, operation and maintenance of schemes, tariff system and cost recovery, gender mainstreaming, environmental sanitation, public latrines, health campaigns, capacity and willingness to pay, sustainable development and community participation. The above themes provided useful reflections on the IWRM context in each case study as indicated in chapters 5, 6 and 7. Participants brought a number of government and project documents in focus group discussions as elaborated on in chapter 4. Notes were accurately taken without any video or electronic devices being used. Stakeholders participated in their personal capacity and views shared were not those of their institutions and were not binding on institutions that employed them at the time of the discussions. All participants gave their informed consent like all other participants as per the informed consent form in the annexures to this thesis.

1.6.8 Data analysis

The data analysis was divided into three phases, i.e. during data collection, after data collection and a combination of during and after data analysis. During the data collection phase data was collected, coded, conceptually organised, interrelated, analysed, evaluated and then used as a springboard for further sampling, data collection, processing and analysis. During this phase findings were discussed with colleagues, notes were compared, consistency was checked and conclusions were drawn (Sarantakos, 2005:345).

The themes that shaped the data analysis include the geography, climate and population in each country, the population in case study areas, water resources and their use, international water uses, water management policies and laws, storage dams, the history of institutions established to provide water and sanitation services, water resources management, finances and sustainability, environment and health, challenges of meeting MDGs, water and sanitation coverage, and obstacles to safe water access, adequate sanitation and hygiene. The latter included weak sector leadership and coordination, poor

maintenance and operation, limited capacity in the sector, hydrological, climatic and geographic challenges, community management and decentralisation.

After the completion of fieldwork the data collected were further analysed and the research objectives and questions, themes, consistency and research paradigms considered. A combination of fixed model and subjective analysis was applied (Sarantakos, 2005:347). The fixed model of qualitative analysis deals primarily with written records of project documents, and the laws and policies of each country which is covered in greater details in Chapter 4 of this thesis. The focus at this stage was content analysis, field notes analysis and text analysis. The data collected were further coded according to themes in the theoretical framework.

Open coding, which means breaking data apart and delineating concepts to stand for blocks of raw data (Corbin and Strauss, 2008:198), was adopted in the analysis. The purpose of open coding was to identify first-order concepts and substantive codes, taking notes constantly, sorting them out, looking for meanings and comparing notes. The data were then labelled according to conceptual patterns which led to the emergence of concepts that eventually became the basis of a theoretical model. Open coding was supported by the NVIVO package used in presenting and analysing qualitative data (Sarantakos, 2005:349).

1.6.9 Validity and reliability

The use of a similar research instrument in various interviews and focus group discussions ensured that the research outcome is consistent and stable (Jackson, 2009:65). Each of the households was expected to respond to similar types of questions in the research instrument. However, there were follow-up questions that were context specific and either semi-structured or unstructured in nature. The reliability of the study was not based on correlation coefficients which measure the degree of relationship between two sets of scores that is used in quantitative research (Jackson, 2009:66) but on themes coded according to the conceptual framework and literature on IWRM.

The content validity was ascertained by asking questions about IWRM implementation that are pertinent to water supply and sanitation that can be adapted in any research setting. Similar questions that were used in Durban were used in Malawi and Ghana and the results can be generalised although there are specific contexts in each area. The research instrument was also valid in the sense that it assessed a theoretical construct in water and sanitation governance, new institutional economics and environmental economics (Jackson, 2009:71).

The thematic areas covered in the research instrument are in line with literature in chapter 2 and theoretical framework in chapter 3 as well as the findings in chapters 5, 6 and 7. This is the basis for the argument that the research instrument used to conduct this study is both valid and reliable.

1.6.10 Limitations of the study

In 2000 when the AfDB adopted IWRM as a policy and a condition for further funding in the sector, and two years later when the Rural Water Supply and Sanitation Initiative (RWSSI) was adopted, more than 20 projects were approved. It was difficult to arrive at three projects that can be considered as representative of the implementation of IWRM in water supply and sanitation sector in Africa. Travelling and conducting research in Africa is expensive and therefore choosing three case studies to reflect on the implementation of IWRM in Africa was limited by availability of funding as well as travel opportunities in each of the countries that were eligible for being chosen as case studies. The availability of research respondents, especially government officials and AfDB staff, was difficult to secure. It was easier to get households to participate in the study as compared to water authorities, AfDB staff and employees of Ministries Responsible for Water and Sanitation. These limitations did not apply in Durban, however, due to the close collaboration that the researcher enjoyed with both communities and municipal officials.

1.6.11 Elimination of bias

A similar research instrument was utilised in all case studies with additional follow-up questions that were determined by respondents in each setting. The research instrument

was crafted using gender neutral words and no participants were identified by race or ethnic group. There were no questions that required participants to indicate whether they were Chewa, Tumbuka, Yao, Lomwe or Ngoni in Malawi and a similar approach was adopted in Ghana and South Africa. There were no questions that reinforced stereotypes such as regards to ethnicity, gender, health, sexual orientation or age. The focus of the study was on the extent to which IWRM implementation is limiting the access to water and sanitation by rural households. The manufactured scarcity that the poor experienced in various parts of Ghana, South Africa and Malawi was neither based on ethnicity, age and people living with aids and disabilities, but upon the people who live in rural areas as a geographically low-income class.

1.6.12 Ethical considerations

The research was conducted within the parameters of the ethical protocols of UKZN. An ethical clearance procedure was complied with and an informed consent form was made available to participants. It was clear in the informed consent covering letter that participants have the intellectual capacity and maturity to understand their involvement in the study and they were making an autonomous decision to participate in the study. Their involvement was voluntary, they had the right to discontinue in the research process, they were not coerced into participation and the study was conducted for academic purposes only. It was also clarified that no harm was caused to participants as a result of participation in the research project and their identities were protected unless they were happy to be cited. Participants were also assured that the information they provided was confidentially stored and used without revealing the identification of participants.

Finally, where there have been disputes with eThekweni municipal officials, e.g. in published articles and slide-show presentations the researcher co-authored, these were handled with professionalism and were in the spirit of constructive critique.

1.6.13 Conclusion

In this research methodology section the rationale for the research paradigm i.e. constructivism, critical theory, post positivism and qualitative data collection methodology was presented. This was followed by the research design, reflecting the explanatory and exploratory elements that shaped the study. The research strategies such as a case study, interviews and action research were comprehensively explained. The strategy adopted to arrive at the sample from the population frame of the study was presented. The themes that were used in crafting the research instrument and interview procedures were presented. Steps were undertaken to analyse the nature of the data and ensure that the research instrument is valid and reliable. The limitations and delimitations of the study and elimination of bias, including ethical considerations were also addressed. In sum, the approach to this topic has been argued, and is compatible with advanced methodology for social research.

1.7 Structure of the thesis

To orientate the reader to the contents of the chapters into which the study is divided, a summary of each is provided (Vithal and Jansen, 2004:30).

Chapter One: General introduction and background

This chapter provides a general introduction to the thesis focusing on the background to the research problem, rationale for choosing topic and sites, objectives and key research assumptions. The chapter provides the outline of the research problem, definition and brief history of IWRM, views of proponents and opponents of IWRM, global trends, African trends, key questions asked, specific research questions, broader issues investigated, principal theories upon which the research project were constructed, research methodology used and the structure of the thesis. The second part of this Chapter provides the methodological framework within which the research is conducted. It provides information on research philosophy, purpose and strategy. It outlines the method of enquiry, the technique used to gather the data, the procedure by which the data was collected and validated, the method of data analysis, interpretation and the consideration of ethics in the research.

Chapter Two: IWRM and the manufactured scarcity of water

This chapter provides a review of the literature on Integrated Water Resources Management. The chapter deals with definitions, characteristics, principles, benefits, barriers, and implications for the implementation of IWRM. It covers what needs to be done to make IWRM work, the role of IWRM and the Africa Water Vision in Sustainable Development, pro-poor development, pro-poor water governance, participation of the poor in their own development, the value and benefits of participation, characteristics of participation, and the implications of participation of the poor in planning.

Chapter Three: Theoretical framework

This chapter provides information about the link between water and sanitation governance theories (the Veblenian dichotomy, collective action, principles of water and sanitation governance, institutional mechanisms, property rights, public and private provision, decentralisation and centralisation, and the role of market mechanisms), new institutional economics theories (transaction costs and information costs, institutional transaction costs, institutional evolution, constitutional choice, law and economics of contracts, theory of institutions) and environmental economics theories (eco-efficiency, sustainability, environmental performance, physical and economic scarcity, and externalities).

Chapter Four: IWRM within the AfDB and other Development Banks

This chapter provides information about the case studies and rationale for choosing Ghana, Malawi and South Africa as case studies including the shift towards IWRM in 1990s and 2000s by World Bank and AfDB respectively. The hydro politics and broader political economics of IWRM in Ghana, Malawi and South Africa and project documents are summarised in this chapter.

Chapter Five: Ghana's water decentralisation, drought and cost recovery

This chapter explains how decentralisation, cost recovery, privatisation and neo-liberal implementation of IWRM by the Water Resources Commission, the Community Water

Supply and Sanitation Agency, the Ghana Water Company Limited and other institutions resulted in the establishment of a water vending market in Ghana.

Chapter Six: Malawi's boreholes, drought and community managed pit latrines

This chapter explores how the commodification of boreholes and unhygienic pit latrines undermined the intentions the government to ensure “water for all, always”, and how decentralisation backfired to weaken local and district assemblies and public utilities. The experience rendered IWRM principles and practice tenuous, as drilling more boreholes resulted in physical scarcity followed by outbreaks of water borne diseases. This chapter also explores geography, climate, population, water resources, water use, international water issues, storage dams, water institution mandates within an IWRM framework, as well as water resources management, finances and sustainability, policies and legislation, environment and health, millennium development goals, water and sanitation coverage, obstacles to water and sanitation access and obstacles to hygiene promotion. This chapter also presents qualitative data that help assess applications of Water and Sanitation Governance, New Institutional Economics and Environmental Economics.

Chapter Seven: Durban's class-based Urinary Diversion toilets

In this chapter a case study deals with how a municipality, Durban, South Africa, introduced Urine Diversion toilets in rural and peri-urban households. The chapter deals with communication and participation problems, institutional shortcomings and the lack of equity that resulted in such innovative and ‘ecologically friendly’ sanitation facilities being rejected by a large proportion of the beneficiary households. The chapter is divided into background knowledge, case study areas, findings and conclusions.

Chapter Eight: Conclusions

In this final chapter, conclusions drawn from the findings of the study are presented. The chapter includes the way forward for reforming IWRM based on the findings, and briefly considers how to frame water as a ‘commons’, in the spirit of Vandana Shiva's (2002) call for genuine abundance, not manufactured water scarcity.

Chapter Two

IWRM and the manufactured scarcity of water and sanitation in Africa

2.1 Introduction

This chapter provides a review of the literature on IWRM and deals with definitions, characteristics, principles, benefits, barriers and the implications for the implementation of IWRM. There are various perspectives on the part of proponents of IWRM regarding what needs to be done to make the concept work. These perspectives have emerged from disputes over implementing the Africa Water Vision in Sustainable Development, pro-poor development, pro-poor water governance, participation of the poor in their own development, the value and benefits of participation, characteristics of participation, and the implications of participation of the poor in planning. This chapter presents an overview of the views of the perspectives of IWRM proponents, as well as critics.

There are global debates regarding the implementation and conceptualisation of IWRM. The problems encountered in Africa are equally experienced in the EU, Canada, USA, South East Asia and the Caribbeans (Nowlan and Bakker, 2010:11-13). In Africa in the 1990s, there was a shift from supply-led to demand-led domestic water and sanitation supply. The key driver in Ghana and Malawi in particular was the implementation of IWRM (Laube, 2007:419, Mkandawire et al, 2011:10). IWRM implementation requires, first, a sustainable water source of sufficient quantity and quality (Jayyousi, 2007:333). The assumption in the implementation of IWRM is that it will bring about sustainability and equity to users, despite population growth.

Furthermore, physical scarcity can be addressed through water demand management. The inexorable increase in the global population and use of water for often wasteful economic purposes puts ever greater pressure on the world's water resources. If management is decentralised to users, IWRM implementation is perceived as a solution to a lack of efficiency, integration and equity. IWRM recognises that there will always be more potential demand for water than there is supply and that to deal with this there is a need for negotiation and compromise (Conca, 2006:121, Goldman, 2004:788). This demand-

supply mantra is used as an excuse to limit access to water in rural households through community management and in urban areas through privatisation and commercialisation (Moriarty, 2003:80, Sanavanan, et. al, 2008:5, Mukhtarov, 2009:1).

According to the Economic Commission for Africa (ECA) (1999:2), promoting integrated management of water resources is essential. This approach is in line with the objectives of Agenda 21 that recognise water as an integral part of the ecosystem, a natural resource, and a social and economic good, the quantity and quality of which determine its utilisation. To safeguard the sustainable supply of safe drinking water, concerted action is needed on all fronts, including agriculture, forestry, industry, transport, urban and spatial planning, population planning, and electricity generation. To prevent further depletion and degradation of freshwater resources, a more holistic approach is being promoted, known as IWRM. Conca (2006:121) is critical of both sustainable development and Local Agenda 21, which he argues were used as excuses for including IWRM in national policies as well as a benchmark that donor and international development agents utilise. It is crystal clear that ecosystem balance is compromised by pollution and recognition of water as an economic good at the expense of water for social, environmental, cultural and food security (Conca, 2006:134, Visscher, Bury, Gould and Moriarty, 1999:1, Biswas, 2008:6, Sanavanan, et. al, 2008:5, Mukhtarov, 2009:1, Jayyousi, 2007:337, Moriarty, Butterworth and Batchelor, 2004:3).

The crux of the problem with the implementation of IWRM, lies with the very definition of the concept (GWP, 2000, de Moran and Ballesterro, 2003:5, Biswas, 2008:7, Sanavanan, et. al., 2008:5, Mukhtarov, 2009:1, Lloyd, et. al, 2006:13). Other definitions of IWRM include the following:

“It is a process of assignment of functions to water systems, the setting of norms, enforcement (policing) and management of water resources. It includes gathering information, analysis of physical and socio-economic processes, weighing of interests and decision-making related to the availability, development and use of water resources” (van Hofwegen and Jaspers, 1999, Moriarty et. al, 2004:6).

“IWRM involves the coordinated planning and management of land, water and other environmental resources for their equitable, efficient and sustainable use” (Calder, 1999, Moriarty, et. al, 2004:6, Nowlan and Bekker, 2010:8).

“IWRM expresses the idea that water resources should be managed in a holistic way, coordinating and integrating all aspects and functions of water extraction, water control and water-related services delivery so as to bring sustainable and equitable benefit to all those dependent on the resources” (EC, 1998, Moriarty, et, al, 2004:6).

Nowlan and Bekker (2010:9) put more emphasis on rescaling, a process which includes bringing local authorities to work in watershed-based groups (scaling up) as well as decentralisation of governance from state, provincial or district to watershed-based groups (scaling down). Both scaling up and scaling down are governance processes practiced in South Africa, Ghana and Malawi and are also evident at the global scale.

It is difficult to establish coordination, equitable distribution, sustainable development and protection of land and water resources in most countries implementing IWRM. In Malawi the Mpira Water Authority, which is responsible for rural water and sanitation, contradicts the pricing strategies of the Southern Regional Water Board (SRWB) which is responsible for urban water supply and sanitation. Whereas the former charges a meagre K50, the latter charges households over K4000 per month. This contradiction highlights flaws in coordination under the IWRM system. The call in Ghana for a Community Water and Sanitation Agency (CWSA) to be responsible for regulating rural water supply and sanitation and district on the one hand, and on the other, for local assemblies to be responsible for the implementation of rural water and sanitation projects created difficulties. Their inability to work together reinforces the standpoint that institutional problems cannot be addressed by pricing mechanisms. The IWRM emphasis on recognition of water as an economic good left rural households in Ghana, Malawi and South Africa without access to water and sanitation; households suffered a lack of financial resources to contribute towards capital contribution, operation and maintenance

that governments are no longer responsible for, due to IWRM implementation. On their part, the technocratic agents of what Goldman (2007:789) refers to as a “green revolution” blame governments for failing to charge the correct prices and for being inefficient and corrupt (Goldman, 2007:794).

Other challenges of IWRM implementation are historical in nature. The implementation of IWRM has global and international connotations. In an attempt to provide guidelines for the implementation of Chapter 18 of Agenda 21 (the action programme of the Rio de Janeiro Conference), the Noordwijk Ministerial Conference for Drinking Water and Environmental Sanitation (1994) summarised key issues in IWRM where international agreement had been reached, and it provided an overview of the main IWRM principles for the drinking water and sanitation (DWSS) sector. The meeting concluded that “access to adequate water and sanitation is a basic need, and the long-term objective in the DWSS sector therefore continues to be safe drinking water supply and sanitation for all”. In Ghana and Malawi the right to water and sanitation is mentioned in various policies although, there is no clause in the constitution which mention these rights directly. However, Article 30 of the 1998 Constitution of Malawi guarantee the right to development which include the right to water. In South Africa, access to water is recognised as a fundamental human right enshrined in the constitution, but IWRM implementation puts more emphasis on water as an economic good. Water supply is considered as an essential need but one that can be met through market mechanisms, given that people are “willing to pay” (Goldman, 2007:790).

In IWRM implementation there is an approach that emphasises that access to water must be accompanied by the need to use water efficiently and to dispose of waste in an environmentally sound manner for the benefit of future generations. In many countries, state authorities recognise this view. However, water demand management is only emphasised in the domestic water cycle. Industrial water users sometimes operate without water licenses, and pollution control becomes problematic. The implementation of IWRM is a precondition for substantial progress towards the common targets of health for all, poverty alleviation, environmental conservation and economic and human development.

To achieve these goals, water and environmental sanitation programmes need to be tailored to the capacities of the local community, which in turn are affected by local socio-economic, environmental and cultural conditions; by the needs of men, women, and children; and by the availability of resources. Practically speaking, the prevalence of water borne diseases in Accra, Durban and Balaka is a setback to sustainable development. The lack of ability to pay for water, which is generally much more expensive in rural areas than urban areas is often disputed by AfDB and other agencies. Even discharging effluents in rivers, the techno-scientific nature of IWRM platforms, and gender inequality remain stark examples of the extent to which IWRM implementation contributes to manufactured water and sanitation scarcity in rural Africa (Visscher, et al., 1999:1, Biswas, 2008:6, Sanavanan, et. al., 2008:5, McDonnell, 2008:131, Lloyd, et. al, 2006:13, Nowlan and Bakker, 2010:9).

It has been widely demonstrated that the over-emphasis of IWRM implementation on “effective management” of water for “economic” and social development is in contradiction with environmental protection and social provision, as well as with the integrated approach it is supposed to promote. At the heart of the water and sanitation crisis are poor management and governance, as opposed to the lack of water as a physical resource (Moriarty, et. al, 2004:3). To achieve sustainable water resource management, appropriate management approaches have to be developed at a number of levels, starting locally with water users, moving to catchment level and then to national and regional level (Nowlan and Bakker, 2010:11-12). Water resource management can include the construction of physical facilities for controlling storage and improving water transport such as dams and canals. This needs to be done in consultation with communities who, in most instances, are displaced without compensation when major infrastructure such as dams, are constructed (Conca, 2006:132). It should seek to identify options for reconciling any gaps that may exist between supply and demand. If demand management is chosen as an alternative, this must be implemented by all stakeholders and not just rural households. Attention must also be given to the system of allocating water between users, which must provide both equity and security for users (Wright, Muller and Ait-Kadi, 2002:7, Biswas, 2008:7, Jayyousi, 2007:335, McDonnell, 2008:131).

According to Guerquin, Ahmed, Hua, Ikeda, Ozbilen and Schuttelaar (2003:28) the plan of implementation developed at the 2002 WSSD proposes that integrated water resources management and water efficiency plans be developed by 2005, with support for developing countries provided through actions at all levels. As much as plans were developed, the fact that by 2008, there were African states that were still without Water and Sanitation Departments, implies that the basic requirement to establish structures before attempting to implement IWRM was never realised. In addition, countries should exploit the potential that water provides for improving cooperation and relations between riparian countries, especially through collaboration on water management and infrastructure development. As a matter of fact, many countries face competition among different uses, in addition to structural factors affecting water supply and demand. An adequate governance of water resources allows for the maximising of economic and social benefits to a targeted area, without hurting sustainability potentials in terms of vital ecosystems. Ghana, Malawi and South Africa developed IWRM plans at the time of writing this thesis, and it is the implementation of these plans that promoted rural water and sanitation scarcity (Biswas, 2008:7, Saravanan, et. al, 2008:5, Mukhtarov, 2009:2, Moriarty, et. al, 2004:4).

The IWRM principles clearly incorporate the need to pursue even conflicting objectives through many political, economic, social, environmental and cultural institutions. IWRM is meant to bring about a shift from water development to water governance. Nowlan and Bakker (2010:7) distinguish water governance from water management in terms of decision making and operational approaches, respectively. This distinction also entails recognising that there are many competing views about how water should be used and allocated, so that various stakeholders should be active participants in water management (Nowlan and Bakker, 2010: 10, Moriarty, et. al, 2004:9). The traditional sectoral 'top-down' role of water professionals is being challenged and the demand is for integration between sectors and users, with sensitivity to the different components of the water cycle.

As an operational tool, the IWRM approach requires important changes to policy, legal and institutional structures, both at the national and at the international level, and these changes impose costs which many developing countries are unable to afford. This contradiction is visible in Ghana, Malawi and South Africa where new laws such as the Water Resources Commission Act of 1996 (Ghana) and the Water Resources Bill (Malawi), and institutions such as CWSA, GWCL, district assemblies (Ghana), local assemblies, district commissioners, and the Mpira Water Authority (Malawi) were created to support IWRM implementation, while rural water and sanitation scarcity continues unabated (Canitano, D'Altorio and Montalbano, 2003:7, Biswas, 2008:7, Saravanan, et. al., 2008:5, Mukhtarov, 2009:2, Jayyousi, 2007:336, Lloyd, et. al, 2006:13, Moriarty, et. al, 2004:7).

The basis of IWRM is that different uses of water are interdependent. Water allocations and management decisions consider the effects of each user on the others. They are able to take account of overall social and economic goals, including the achievement of sustainable development. A crucial point about IWRM is that it entails different activities at different scales of water allocation. Yet the emphasis is not on scaling up and down using a watershed-based management model (Nowlan and Bakker, 2010:9, Cohen, 2012:3). Instead, IWRM at a national level is mainly about developing policy and legislation, as well as encouraging better cooperation between national stakeholders. Catchment or river basin IWRM is about making allocation decisions, preferably with the full involvement of catchment stakeholders. IWRM at local levels, while also often involving allocation decisions, is more about the optimal use of resources at the local level, and about ensuring that local activities do not adversely affect the quality or quantity of water available to downstream users which is common in most cases (Moriarty, 2003:87). The objective of IWRM is to ensure optimal and sustainable use of water resources for economic and social development, while still protecting and improving the ecological value of the environment (Visscher, et al., 1999:1, Biswas, 2008:6, Jayyousi, 2007:336).

In implementing IWRM, the emphasis tends to be more on the economic goals of water at the expense of sustainable development and participation in the form of water user associations (WUAs). When required by donors, this becomes a top-down approach imposed on rural communities who were expected to pay for construction, operation and maintenance of water and sanitation schemes. Those who were not willing to pay were simply excluded. Participation in local IWRM platforms was thus more tokenistic than being a symbol of empowerment brought about by IWRM.

According to His Royal Highness the Prince of Orange (2002: 3) there were seven challenges that faced Ministers Responsible for Water and Sanitation when they signed their declaration at The Hague Ministerial Conference in March 2000:

1. Meeting basic needs to recognise that access to safe and sufficient water and sanitation are basic human needs and are essential to health and well-being, and to empower people, especially women, through a participatory approach of water management.
2. Securing the food supply to enhance food security, particularly for the poor and vulnerable, through more efficient mobilisation and use, and the more equitable allocation of water for food production.
3. Protecting ecosystems to ensure the integrity of ecosystems through sustainable water resources management.
4. Sharing water resources to promote peaceful co-operation and developing synergies between different uses of water at all levels, whenever possible, within and, in the case of boundary and trans-boundary water resources, between states concerned, through sustainable river-basin management or other appropriate approaches.
5. Managing risks in order to provide security from floods, droughts, pollution and water-related hazards.
6. Valuing water enough to manage it in a way that reflects its economic, social, environmental and cultural values for all its uses, and to move towards pricing water services to reflect the cost of their provision. This approach should take account of the need for equity and the basic needs of the poor and the vulnerable.

7. Governing water wisely to ensure good governance, so that the involvement of the public and the interests of all stakeholders are included in the management of water resources (Jayyousi, 2007).

Critics of IWRM (Biswas, 2008: 8, Saravanan, et. al., 2008:6, Mukhtarov, 2009:2, Jayyousi, 2007, McDonnell, 2008:132) argue that it has little practical resonance on the present or future water management practices and lack feasibility as governments are still divided into functional areas. Goldman (2007:794) is critical of the Prince of Orange's valuing water rubric, blaming him for the introduction of accounting methods for water services which put a market price on water whilst promoting large-scale privatisation of water throughout Africa and the world at large.

Critics further argue that IWRM lacks legislation or appropriate policy frameworks to support integration; it is imposed by the water experts on other government levels and disciplines such as land and agriculture and it is imposed by donors as a pre-condition for funding. Another criticism of IWRM is that it lacks quantification of what constitutes economic and social welfare, and it is very thin on details about equity, sustainability and vital ecosystems. IWRM is to a large extent not practical to implement and operate at any level of government and even more complicated in decentralised local government structures. The critical policies that are pre-conditions for implementation of IWRM are often exploited by high officials in political institutions that claim that they are experts in the field. In some instances, there are different plans for each sector. The separation of environmental management institutions from water institutions thereby results in institutional conflicts and the creation of local elites that exploit the poor. IWRM has a technical rather than a social focus and results in a shift from a supply-led to a demand-driven approach (Saravanan, et. al. 2008:10, Mukhtarov, 2009:4, McDonnell, 2008:141, Lloyd, et. al, 2006:13).

2. 2 Characteristics of IWRM

The decentralisation component of IWRM, i.e., decision-making that needs to take place at the lowest level possible, has generally failed as a water management principle in most

African countries. Institutions such as the Water Resources Board (Malawi) and Water Resources Commission (Ghana), which are responsible for the regulation of water resources development, needed local and district partner institutions that can regulate borehole construction. This was the weakness of the national ministries such as Housing, Public Works and Water Resources (Ghana) and Irrigation and Water Development (Malawi). In these cases, local authorities are expected to perform functions that national ministries failed to perform themselves. Worse, these new decentralisation requirements were imposed during the 1990s era of structural adjustment programmes and the subsequent 2000s requirements associated with Poverty Reduction Strategy Papers; they were not home-grown initiatives within each of these countries.

2.2.1 Decision making

The basic IWRM concept has been extended to incorporate participatory decision-making. The related transaction and information costs in the form of time, effort and resources involved in obtaining information required to negotiate and enforce institutional changes are rarely factored in during IWRM implementation, especially when decision-making is concerned. Cohen (2012) distinguished between electoral and participatory democracy; a similar challenge emerges when implementing IWRM. The challenge of electoral democracy is that citizens do not vote for a watershed-management process, and so other democratically elected stakeholders tend to take most of the decisions (Saravanan, et. al., 2008: 11, Cohen, 2012).

Deliberate management of resources is needed to ensure long-term sustainable use. The term ‘management’ is used in its broadest sense. It emphasises that we must not only focus on development of water resources but rather consciously manage water development in a way that ensures long term sustainable use for future generations using various operational approaches (Nowlan and Bakker, 2010:7). Moriarty (2003:84) raised a concern that whilst IWRM is now well-accepted at an international level, and while an increasing number of countries are adopting new water laws to address its basic principles, most concrete activities has been decidedly top-down. This view is also supported by Fischhendler and Heikkila (2010) who established that implementation of

IWRM in Israel resulted in a promulgation of omnibus law and top-down approach instead of bottom-up.

Although IWRM touches upon many issues that are crucial for the adequate planning, implementation and management of drinking water supply projects, there is little evidence of IWRM principles being applied within the drinking water and sanitation sector due to the fact that IWRM is perceived as a river basin and trans-boundary concept. Nowlan and Bakker, (2010), Cohen, (2012) and Cohen and Davidson (2011) link IWRM mainly with watershed management. The key concepts that one find in IWRM, include equity, efficiency and sustainability, but evidence on the ground points to the lack of operationalisation of these concepts in projects (Moriarty, et. al, 2004:6). The water supply and sanitation sector as a whole has a vital interest in involvement in IWRM to safeguard the right of people to access domestic water in the face of growing competition from other uses and sectors (Jayyousi, 2007:336, McDonnell, 2008:132, Moriarty, et. al, 2004:6).

The IWRM concept is sometimes also rejected on the basis that its proponents are not providing adequate guidance on how it is incorporated into policy, planning, decision-making and management. Cohen and Davidson (2011:5) make reference to policy-sheds and watershed to illustrate artificial boundaries between catchment area and political boundaries of a local authority, region, district and national government. River basins are hydrological units, whereas local authorities are crafted based on wards that are not necessarily linked to a water resource. At a policy level, there are issues that cover the entire catchment and may not be relevant to certain local authorities. This may be manifested in policy gaps as well as in gaps in legislation and law enforcement. In some instances a national government agency can regulate better and in some instances a local authority can be a better agent (Cohen and Davidson, 2011:5). The principle of subsidiarity is complicated in practice.

The other dilemma is that what works at a river basin level, may not work equally well at local government or public water utility level. There are also elements of top-down

participation, rewarding of individual initiatives rather than collective efforts, fraudulent actions in stakeholder identification, centralisation of budget allocations, conflicts and contests among stakeholders. These are some of the issues that the self-appointed custodian of IWRM concept, the Global Water Partnership (GWP), has ignored. The cooperation amongst riparian countries in West Africa (Ghana, Ivory Coast, Burkina Faso and Togo), in the Volta River Authority (which is not visible in practice) and the conflict between Malawi and Tanzania over the ownership of Lake Malawi (subjected to SADC for mediation in 2012) both cast a shadow of doubt regarding the usefulness of IWRM, even in shared water courses (Visscher, et al., 1999:2, Biswas, 2008:10, Saravanan, et. al., 2008:11, McDonnell, 2008:132, Moriarty, et. al, 2004:6, Matonga, 2012).

2.2.2 IWRM is a systematic process

Supporters of IWRM believe that it is a systematic process for the sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives. They further argue that it is different from the sectoral approach applied in many countries, Fischhendler and Heikkila (2010) show how in the State of Israel IWRM implementation resembles most of the features of the old system.

But rhetoric of change continues to predominate. According to Moriarty (2003:84), IWRM is part of a wider effort to manage the world's resources in a more sustainable manner. Because of this, IWRM differs from earlier engineering approaches to water management in that it attempts to work within a framework of the whole hydrological cycle, to see how water interacts with other elements of the ecology and how it is linked to land management. Evidence in South Africa, Ghana and Malawi will highlight that IWRM implementation tend to be similar to engineering approaches. The over-emphasis of engineering solutions at the expense of social and equity considerations often lead to unsustainable management of boreholes and widespread exposure of the poor to sanitation-related pollution (Saravanan, et. al., 2008:10, McDonnell, 2008:133, Moriarty, et. al, 2004:7).

IWRM is preferred by its proponents because they believe that it include all the different phases of water flux, which are often referred to under different colours: blue water for surface and ground water resources; green water for the soil moisture used by plants; white water for atmospheric moisture; and brown and grey water for the effluents coming from sanitation and urban run-off. IWRM implies looking at the whole 'system', social, political, and physical (hydrological); at integrating the needs of all users upstream and, downstream; and at balancing these needs in a way that satisfies the needs of the greatest number possible in a sustainable way while maintaining a healthy environment. The whole system approach is complicated by pollution, environmental problems, the effects of globalisation, and the role of markets which are difficult to reconcile (Saravanan, et. al., 2008:10, Jayyousi, 2007:330, McDonnell, 2008:133, Moriarty, et. al, 2004:7). In dealing with the systematic approach that IWRM intend to enhance through integration, there are a number of issues which are difficult to integrate and that remain dialectically opposed in South Africa, Ghana and Malawi.

Critics of IWRM question the very objectives such as economic efficiency which are in opposition to social welfare. For IWRM to be operationalised it is imperative to deal with other diametrically opposed approaches which are based on prioritisation of environmental quality, water supply and demand, surface water and ground water, water quantity and water quality, or water and land stewardship. In many countries including Ghana, Malawi and South Africa, balancing some of the above competing issues require bringing together various stakeholders and not just water resource management experts. Added to the often divergent agendas for water management are complications arising from different types of water uses: domestic, industrial, agricultural, navigational, recreational, environmental and hydropower generation, water and ecosystem, water supply and waste water collection, treatment and disposal. In various IWRM platforms I visited, agriculture, industrial and recreational sectors are mostly not visible in platforms. In South Africa, commercial agriculture withdraws over 62% of freshwater compared to the 30% withdrawn during the Apartheid era (National Water Resources Strategy, 2013)

The management of water resources in Ghana and Malawi is delegated to CWSA and Mpira Water Authority, respectively. In geographical terms, urban and rural water processes remain highly contested. Other sources of conflict emanate from irrigation and drainage, water and health, water institutions at national, regional and local levels, public and private sector provision, and the economic and social instruments required for water management. At the centre of contradictions, is contestations of power within government institutions, for example the pricing strategies of Mpira Water Authority is not the same as SRWB in Malawi. Such contradictions can be harmonised by introducing a watershed approach; according to Cohen and Davidson (2011:2) and Nowlan and Bakker (2010). This has been useful in Canada and in South Africa, a watershed approach is operationalised through the establishment of CMAs. The other contradictions remain between legal and regulatory issues relating to water management and upstream and downstream issues and interests of various users (Biswas, 2008:11, Saravanan, et. al., 2008:10, Jayyousi, 2007:330, McDonnell, 2008:133).

Other equally important problems that are difficult to integrate within IWRM are the interests of various users, competing policies of different sectors that have water-related functions, and bottom-up and top-down approaches to water management. The case study of UD sanitation in Durban is a good example of top-down sanitation delivery. Communities claim that they were not consulted when the project was operationalised whilst the municipality claim that there were adequate consultations (Interviews with Induna Ngcobo and Councillor Njabulo Ntanzu). There are different voices calling for centralisation and decentralisation, as well as various climatic, physical, human and environmental impacts that needs to be addressed. The other issues that are always contested are the interests of the rich and the poor, interests of project beneficiaries and providers, gender-related differences, the trade-off between present and future needs, technologies and related social concerns, interests of donors and recipients, water pollution, air pollution, solid waste disposal and related water linkages. The biggest challenge is to harmonise the competing needs of each of the stakeholders within a watershed (Biswas, 2008:11, Saravanan, et. al., 2008:10, McDonnell, 2008:134).

2.2.3 Reforming water institutions

In Malawi and Ghana the AfDB put a condition to reform institutions, to create an enabling environment for private sector participation, separation of rural water supply agency from urban water supply agency, community management in rural areas and commercialisation of public utilities. In South Africa donors are interested in harvesting urine to manufacture fertiliser (personal communication with Neil Maccloud on 20 April 2011, Laube, 2007:7, Fuest, 2005:11, Mkandawire et al, 2011:20). According to Guerquin, et al, (2003: 29) fragmented, sub-sector approaches to water management need to change to integrated efforts based on widespread international agreement. This concern is equally shared by Norman and Bakker, (2008:5), Cohen and Davidson, (2011:2) in their case studies of watershed management in various catchments in Canada. Their key concern is that municipal and hydrological boundaries are always in conflict and that can be better addressed by introducing watershed management options. Reforming water institutions envisaged in IWRM implementation is not addressing watershed management issues (Nowlan and Bakker, 2010).

This requires developing effective water policies and action programmes in every country, creating mechanisms in every country such as a national water council to oversee water reforms, coordination and encouraging the creation of river basin and other decentralised organisations. Ghana, Malawi and South Africa developed both water and sanitation policies as required by AfDB as a condition for the implementation of IWRM. The other condition is to put people at the centre by switching to demand-responsive approaches, harnessing potential of communities and, involving users including women in planning and operation, and developing their resilience. All of the above did not yield good results in Israel since agriculture remain the dominant user of water resources and establishing water councils and authorities did not reverse the situation. In theory water allocation is supposed to be negotiated by various stakeholders, but in practice power relations are always at play (Fischendler and Heikkila, 2010).

In South Africa, Malawi and Ghana, water and sanitation authorities resorted to community management in rural areas. Boreholes were only constructed after

communities contributed capital costs and maintenance costs in Ghana and Malawi, although in Durban communities initially contributed through their labour and subsequently emptying UD toilets. In Ghana and Malawi Poverty Reduction Strategy Papers (PRSPs) were designed in order to improve the delivery of water services by opening the sector to a wide range of service providers, large and small, public and private and ensuring that they are autonomous, well-regulated, and accountable.

This was an excuse for the commercialisation of all five water boards in Malawi and the transformation of Ghana Water and Sewerage Company into Ghana Water Company Limited and the wide-ranging privatisation that subsequently followed. Goldman (2005) criticised participation of NGOs such as Water Aid for their implicit advocacy of water and sanitation commodification and privatisation-initiatives, for they soon became active agents of global neoliberalism by strengthening and legitimating the Global Water Partnership, World Water Council and World Commission on Water for the 21st Century. Privatisation and community management were promoted as vital for efficient, equitable, sustainable water use and conservation because they promote participatory, ecosystem-based management. But the results are in reality, negative (Lloyd, et. al, 2006:35, Goldman, 2005).

There is also an increasing tendency within riparian states to establish frameworks for the mutually beneficial uses of shared-water resources. Although national and trans-boundary water resources pose different challenges, many, of their water management needs are the same (Lloyd, et. al, 2006:35, Cohen and Davidson, 2011, Nowlan and Bakker, 2010, Cohen, 2012). A 'militarily powerful' country like Tanzania frequently threatens Malawi with war if they do not cede parts of Lake Malawi to her (Matonga, 2012). AfDB also expects funded-countries to improve management structures and institutions through learning and capacity-building, accompanied by systematic evaluations. It will be established that the management improvement prescribed by AfDB did not contribute towards capacity building in various countries in Africa (McDonnell, 2008:135, Moriarty, et. al, 2004:8).

IWRM demands a new framework within which there may be a need for significant changes in existing interactions between politics, laws, regulations, institutions, civil society, and the consumer-voter. The capacity to make these changes depends therefore on changes in governance (Rogers and Hall, 2003: 5). The IWRM philosophy aims at involving all actors: individuals, companies, organisations, and governments. IWRM addresses all sectors of water: irrigation, domestic water supply, industry. And IWRM operates at all levels: local, national, and transnational (Moriarty, 2003:84, Saravanan, MacDonald and Mollinga, 2008:4, McDonnell, 2008:135, Lloyd, et. al, 2006:35, Moriarty, et. al, 2004:7).

The outcomes of institutional arrangements are not necessarily the desired ones. Decentralisation results in de-concentration by national government departments of local functions, powers are devolved in theory but in practice national spheres of government still dominate due to budget allocations and regulatory framework that concentrates powers and decisions at the central level. Accountability remains superficial and upwards (in a hierarchy form) thereby ensuring the retention of central government control. There is lack of coordination and consultation and skewed distribution of benefits favouring the rich, lack of cost-sharing and cross-subsidisation, all of which ensures that IWRM will not benefit the poor (Saravanan, et. al., 2008:13, Lloyd, et. al, 2006:35, Moriarty, et. al, 2004:8).

2.3 Why IWRM?

Proponents of IWRM (UN-Habitat, 2008, Moriarty, et. al, 2004:3) argue that its implementation could assist in addressing the world water crisis especially with regard to its impacts on the poor. Their arguments are based on the physical scarcity of water as a resource, which could be addressed by IWRM implementation. Opponents of IWRM (Biswas, 2008, Saravanan et. al, 2008:4, McDonnell, 2008:141) argue that the strategy is techno-centric, is based on linear models of water resources management and does not incorporate local knowledge and collective action.

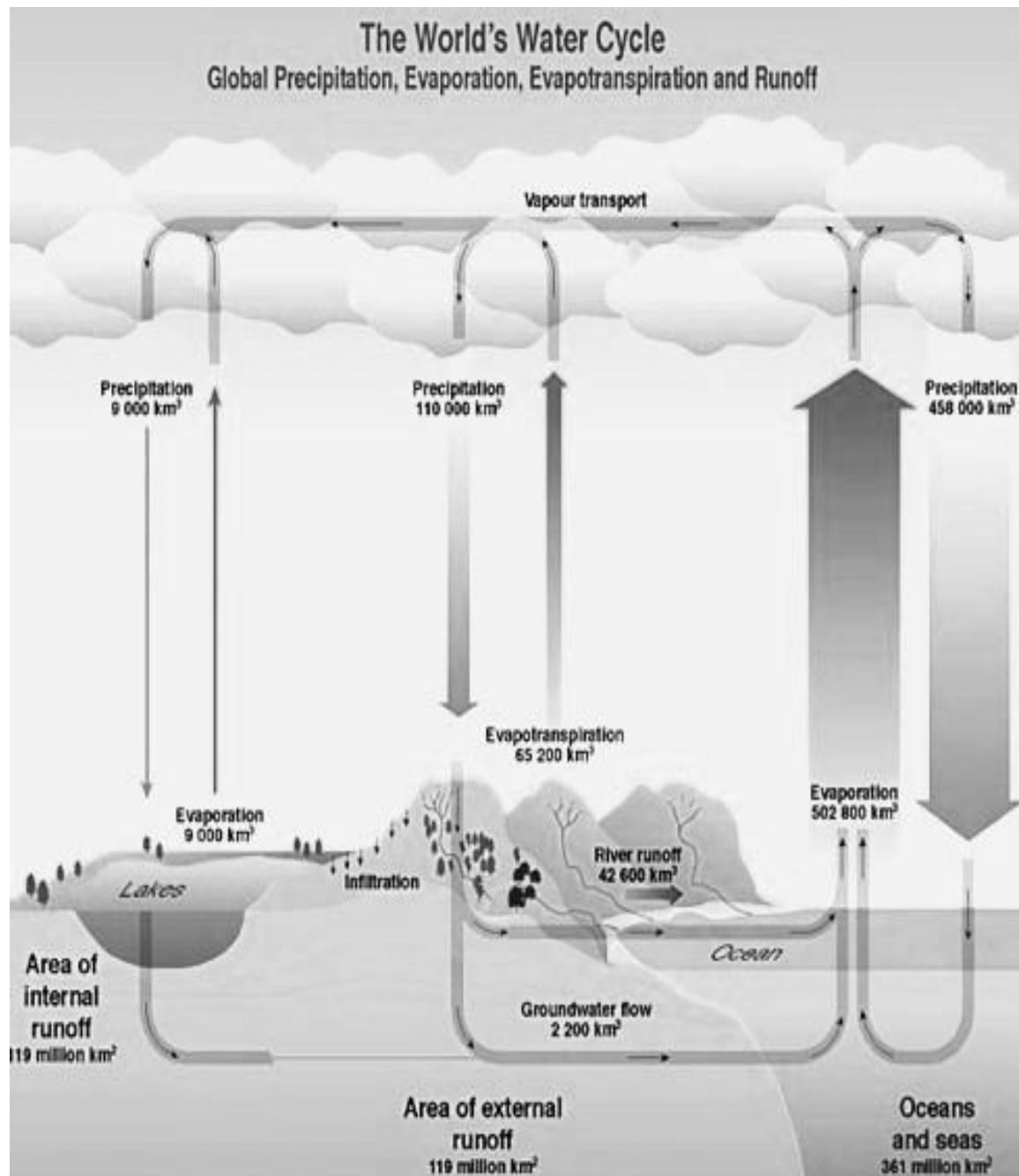
Supporters of IWRM further argue that global water is estimated at 97% seawater and 3% freshwater respectively. Of the freshwater, 87% is inaccessible and 13% accessible (0.4% of total). Today more than 2 billion people in over 40 countries are affected by water shortages; 263 river basins are shared by two or more nations; and 2 million tonnes per day of human waste is deposited in water courses. As a result half the developing world's population is exposed to polluted sources of water and increasing water-borne or water-related disease. It is further estimated that about 90% of natural disasters in the 1990s were water-related. Scarcity is another concern, for the increase in numbers of people on earth from 6 billion to 9 billion will be the main driver of water resources management over the next 50 years. Scarcity, which mostly affects rural inhabitants in Africa, is allegedly caused by the shortage of water as a physical resource. According to Goldman (2005:793), however, water scarcity is exacerbated by proponents of IWRM who appear to be presenting 'facts' that ignore the impact of privatisation on the poor (Goldman, 2005:793, UN-Habitat, 2008, Jayyousi, 2007:331, Moriarty, et. al, 2004:3).

Without question, the world's freshwater resources are under increasing pressure, and climate change will exacerbate physical scarcity problems, especially in inland of Africa. Water is vital for human survival, health and dignity, and is a fundamental resource for human development. Figure 2.1 below illustrates the link between global precipitations, evaporation, evapo-transpiration and run-off which is the reason why governments and other stakeholders need to take action since the world is expected to run out of freshwater resources (UN-Habitat, 2008, Jayyousi, 2007:331, Moriarty, et al. 2004:3).

The other causes of freshwater depletion are the growth in population, increased economic activity and improved standards of living which lead to increased competition for, and conflicts over, the limited freshwater resource. Factors such as mining, discharging of effluents to water resources, poor management of wastewater treatment plants, irrigation and private property rights are also becoming important explanations of depletion of freshwater resources in Africa, many of which are perpetuated by the implementation of IWRM. A combination of social inequity and economic marginalisation forces people living in extreme poverty to over-exploit soil and forestry

resources, with damaging impacts on water resources. An example is when the SRWB subject households to water rationing. In response, people tend to use standpipes provided for by Mpira Water Authority or resort to unprotected shallow wells.

Figure 2.1: An overview of the state of the world's fresh and marine waters



Source (UNEP) 2002. Vital Water Graphics

Vorosmarty et al (2010) highlight lack of balance between ecosystem protection and human resource uses of water as an important contribution to water scarcity. According to the Economic Commission for Africa (ECA) (1999:3), if the current trends of high population growth and environmental degradation are not controlled, the situation will become critical. It is therefore necessary to embark on parallel actions to reduce population growth (especially by the wealthier water consumers who use many times more water than poor people), protect and rehabilitate the environment and take a holistic approach to the integrated management of water resources.

Water withdrawals have increased more than twice as fast as population growth and currently one third of the world's population live in countries that experience medium to high water stress. Pollution growth is further enhancing water scarcity by reducing water usability downstream. Water scarcity maps presented in chapters 1, 4 and 8 highlight the fact that Ghana, Malawi and South Africa are not likely to experience physical scarcity by 2030, but instead face the durable problem of economic scarcity, lack of access by poor people- as a result of biased water and sanitation governance perpetuated by the implementation of IWRM (UN-Habitat, 2008, Lloyd, et. al, 2006:39, Moriarty, et. al, 2004:3).

Shortcomings in the management of water, a focus on developing new sources rather than managing existing one better, and top-down sector approaches to water management results in un-coordinated development and management of the resource. According to Obasi (2003:11) it is noteworthy that under a number of circumstances, poor management and wasteful practices hinder our opportunities to maximise the available water resources. For example, in many developing countries, 70% of the available freshwater is used for irrigation and most of these irrigation systems are working inefficiently as they lose about 60% of withdrawals to evaporation, return flow to rivers and ground water aquifers. In some cases, 50% of water distributed for public use is also lost through leakage that also pollute treated water and through vandalism. In Durban, especially in Ntuzuma where municipal pipes are leaking, it was difficult for the municipality to enforce credit control measures (Nojiyeza, 2015, forthcoming). Integrated planning and

management of water resources can, in some cases, ensure availability, rational use and environmental protection which remains a challenge is effluents are discharged in laggons in Ghana and uMhlanthuzana river in Durban (Bond:2014). In Ghana and Malawi, water that is ‘unaccounted for’ is still very high despite water conservation and demand management strategies implemented by the ministries responsible for environmental affairs (Lloyd, et. al, 2006:34, Moriarty, et. al, 2004:10).

Current concerns about climate change demand improved management of water resources to cope with more intense floods and droughts, and greater evaporation due to warmer temperatures. In most countries, there are environmental protection agencies (Ghana) and departments responsible for disaster management and climate change adaptation (Malawi), but IWRM implementation tend to focus on water storage facilities with dam walls higher than five meters. In Durban, government is planning to raise the Heazelmere Dam which is likely going to result in precipitation, sedimentation and climate variability (Nojiyeza, 2015 forthcoming). Effective water-related climate adaptation plans are still a pipe dream in Ghana and Malawi (Lloyd, et. al, 2006:34), although in Durban, Climate Protection Unit developed climate smart policies (Nojiyeza, 2015, forthcoming)

There is a strong view that water is a vital resource for human survival and economic development. As populations and economies grow, water demand increases while the availability of the resource remains constant. Shortages engender water use conflicts, both in terms of quantity and quality (Lloyd, et. al, 2006:33). There is considerable variation across countries among laws and institutions that govern water usage and planning and project implementation ability is not uniform. According to the Inter-American Development Bank (IDB) (2006) the Eighth General Increase in the Financial Resources of the Bank, calls for guidelines that are flexible enough to be tailored to different situations involving institutions, legal instruments, and the technical means to achieve an integrated approach to planning that considers all sources and uses of water in a given basin. The AfDB adopted a policy on IWRM in 2000 and it is a pre-condition for funding for a country to develop efficiency and IWRM plans (ADF, 2005: 20).

The weakness of IWRM implementation is the failure to factor in land use management and participation in environment impact assessments (EIAs) by communities that are likely to be affected by the construction of water resources infrastructure. It is a common practice to find communities that were displaced as a result of large dam construction, yet are still lacking access to water and electricity. There is a need to encourage a comprehensive approach to water resources management activities, when warranted by the characteristics of the problem. The integrated management of other resources in the watershed, such as soil and vegetation, is included, as is beneficiary participation (Lloyd, et. al, 2006:34, Moriarty, et. al, 2004:10).

Both the IDB and AfDB hold the belief that the adoption of IWRM as a policy condition for loans is a step in the right direction. They both emphasise that financial resources will be directed towards supporting water resources planning, policy making and management through the development of Bank strategies. The strategies should take into account the core problem of developing multiple sources and managing multiple uses (municipal, industrial, irrigation) of water so that, over time, more efficient water resource supply systems and usage patterns emerge, while maintaining or improving ambient water quality.

One consideration is the identification and preparation of water resource project investments (potable water supply, sewerage, wastewater treatment, irrigation, etc.) that are efficient (net benefit maximising) or at least cost-effective (cost minimising). Such investments should factor in non-monetised impacts under a multiple objective framework. Better use and quality of water resources might also be obtained through a reduction of water system losses, optimal water pricing or marketing policies, privatisation, decentralisation, effluent discharge regulation, water quality monitoring and enforcement, soil and water conservation programmes, non-point source pollution control, and water and soil conservation measures.

In this thesis, however, chapters 5, 6 and 7 demonstrate how regulation and pollution control are compromised by market policies, privatisation and decentralisation. The key pillars of IWRM such as decentralisation, privatisation and lack of subsidies from the state, are not working in Africa (Inter-American Development Bank, 2006, AfDB, 2000, Moriarty, et. al, 2004:10).

The rationale for the adoption of IWRM is well argued, but major questions remain about operational application and practicability. The successes recorded in South Africa and Chile (Pena, 2009:167; Muller, 2009:180) are based on recognising water as a social good, on providing adequate state subsidies and on emphasising much less of the IWRM rubric of water as an economic good and of a form of decentralisation that leaves the national state as a facilitator and regulator. Pena (2009:167) acknowledged that Chile didn't adopt or implement IWRM, but instead attempted institutional realignment and integration which required the state to subsidise the poor and drive state-led environmental sustainability through vigorous pollution controls that could not be left to the markets.

Muller (2009:183) emphasised the importance of social objectives in IWRM implementation and the state's strong technical capacity (in this case, the national Department of Water Affairs) as precursors for the implementation of IWRM at a local government level. He was referring to free basic water that the South African Government provides to each household as part of the overall recognition of water as a social good. Local authorities are given financial and technical support in order to be able to provide each person with at least 25 litres of water per day (Muller, 2009:180). In the next section the focus is on the original principles of IWRM and the extent to which they exacerbate water and sanitation scarcity in Africa (Biswas, 2008:13, Moriarty, et. al, 2004:4).

2.4 Dublin principles of IWRM

A meeting in Dublin in 1992 gave rise to four principles that have been the basis for much of the subsequent water-sector reforms. The International Conference on Water and

Environment acknowledged that fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment (Biswas, 2008:14). (Contrary to some reporting, this was not the genesis of the IWRM, as earlier attempts were made during the United Nations Water Conference held in Mal del Plata, Argentina, in March 1977 and the outcomes of this conference were endorsed by members of the UN.) The Dublin meeting was attended by water experts and its outcomes were never adopted within the UN system (Biswas, 2008:14, Maganga, et. al, 2002:919, Jayyousi, 2007:329, Moriarty, et. al, 2004:5). But it remains an important marker of the ideological acceptance of water as an economic good.

Principle No. 1

The first IWRM principle is that freshwater is a finite and vulnerable resource, essential to sustain life, development and environment. Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with the protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or ground water aquifer. Central government support through the creation and maintenance of an enabling environment is required. There is a view that the role of central government in IWRM should be one of leadership, aimed at facilitating and coordinating the development and transfer of skills, and assisting with the provision of technical advice and financial support, to local groups and individuals. This view, which dominates IWRM implementation, is the reason why the Ministry of Housing, Public Works and Water in Ghana devolved rural water supply to CWSA and sanitation delivery to district assemblies. Officials in the Ministry of Irrigation and Water Development in Malawi were also following this thinking when they devolved rural water supply and sanitation to Mpira Water Authority and urban water supply and sanitation to SRWB. Where specific areas of responsibility fall outside the mandate of a single government department, appropriate institutional arrangements are required to ensure that there is effective inter-departmental collaboration. In Ghana, CWSA, district assemblies, Ministry of Food and Agriculture (MOFA), Ministry of Health, Environmental Protection Agency (EPA), Water Resources Commission (WRC), Forestry, Mines and Lands Commissions, traditional

leaders, spiritual leaders, water user associations (WUAs) and WATSAN committees are some of the stakeholders that cooperate in an IWRM platform such as the Volta River Authority. In that regard effective IWRM is a top-down meets bottom-up process (Moriarty, Butterworth and Batchelor, 2004:5, Maganga, et. al, 2002:919, Lloyd, et. al, 2006:32).

Principle No 2

The second principle advocates that water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels. The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects (Biswas, 2008:20). This principle is criticised for its weakness in promoting integration at a higher macro-level, therefore bottom-up approaches at the micro-level are highly unlikely to contribute to integration at higher levels of government. Most countries promulgated decentralisation laws in line with this principle, but fiscal decentralisation, and lack of capacity building in local and district assemblies are some of the difficulties that most countries face (Biswas, 2008:20, Moriarty, Butterworth and Batchelor, 2004:5, Maganga, et. al, 2002:919, Lloyd, et. al, 2006:32).

Principle No. 3

The third principle calls for women to play a central part in the provision, management and safeguarding of water. The pivotal role of women as gatherers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address specific needs of women and to equip and empower them to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them. Recently the role of both woman and men was recognised in managing water effectively (Lenton and Muller, 2009:208).

Governments of both Ghana and Malawi emphasise the role of women in IWRM platforms, but the majority of women are either part of tap committees or borehole committees and their participation is still anticipated in WRC (Ghana) WRB (Malawi) WUAs and WATSAN (Ghana) and Mpira Water Authority (Malawi). At the moment very few women make major water resource management decisions in most countries (Moriarty, Butterworth and Batchelor, 2004:5, Maganga, et. al, 2002:919, Lloyd, et. al, 2006:32). In South Africa, women have served as Water Ministers for more than half the democratic government's 20 year existence, but did not result in necessarily women-friendly water policies.

Principle No. 4

The fourth principle emphasised that water has an economic value in all its competing uses and should be recognised as an economic good. This is the principle that dominates the implementation of IWRM and accounts for the greater part of its failures in Africa. With this principle supporters of IWRM believe that it is vital to recognise first the basic right of all human beings to have access to clean water and sanitation at an affordable price.

A contradiction, however, appears in the Africa Water Facility (AWF) of the African Council of Water Ministers (AMCOW): the claim that the poor are 'willing to pay' higher prices. AMCOW and AWF are of the view that past failure to recognise the economic value of water has led to wasteful and environmentally damaging uses of the resource. The African Development Bank also firmly believe that managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources. The observation in most African countries and elsewhere point to a different direction regarding recognition of water as an economic good (Moriarty, 2003,84, Moriarty, Butterworth and Batchelor, 2004:5, Maganga, et. al, 2002:919, Jayyousi, 2007:329, Lloyd, et. al, 2006:32).

Jayyousi (2007:329) presents an alternative argument: water is a human right with social value and a social good and it is problematic to treat it just like any other commodity that is priced in such a manner that only those who could afford it purchase it. The economic value and good of water contradicts the human right and social good. As we see in future chapters, this is one of the two central contradictions in IWRM that have led to its failure in various African contexts.

2.5 Principles of IWRM developed after Dublin

In addition to the four Dublin Principles of IWRM, Visscher, Bury, Gould and Moriarty (1999: v) proposed a further eight principles based on the Dublin principles and more recent developments. The eight principles are as follows:

2.5.1 Water source and catchment conservation and protection are essential

Environmental degradation of water resources may have an immediate and severe impact on water supply situation of the users. It may result in adequate performance of water supply systems because of pollution and siltation problems, or systems being abandoned because of water sources drying up. This may have an effect on the health of the users, but also may cause considerable economic losses. Agricultural output and productivity also decline because of environmental degradation resulting from drainage and irrigation practices. At the same time, people with marginal livelihoods may have few options apart from unsustainable practices. Water source and catchment conservation and protection includes, amongst others, soil and water conservation strategies, pollution control measures, and sound land use practices. Lenton and Muller (2009:207) are of the view that environmental protection and promotion of economic and social development are not a contradiction. However, the prescriptive nature of IWRM sharpens these contradictions (Visscher, et al., 1999:7, McDonnell, 2008:135, Lenton and Muller, 2009:208).

Most supporters of IWRM argue that it should be applied at catchment level (Lenton and Muller, 2009:2008, Nyagwambo, 2008:4). The catchment is the smallest complete hydrological unit of analysis and management. Integrated catchment management (ICM), therefore, becomes the practical operating approach. Although this approach is obviously sound and finds wide acceptance, too narrow an interpretation should be avoided. The Dublin Principle that catchment management and source protection are essential to ensuring sustainability of supply is focused on asking the following key questions (Maganga, et. al., 2002: 920, Moriarty, et. al, 2004:13):

- Are sources adequate for both current and projected domestic use including small scale productive uses?
- Are they reliable throughout the year and over the years? Many sources suffer from seasonal or periodic failure.
- Is ownership of the source controlled by the community? Are there competing claims to it by other users or uses? (Moriarty, 2003:90, Maganga, et. al, 2002:920, Lloyd, et. al, 2006:39).

If the answer to any of these questions is no, then action will need to be taken to ensure that adequate supply can be assured. Involvement of the community in watershed management activities, particularly where these are small scale, can be highly beneficial. Ensuring the sustainability of the source may be something for a community to do so, on its own, or alternatively be something that is too large scale for much meaningful action. There is also an intermediate level, which occurs most commonly with multi-community schemes, where a common source is shared and where it is necessary to work in collaboration with other communities. A framework for deciding on allocation issues may need to be developed between communities. A crucial adjunct to source protection is effective monitoring, to know how much water is available and when. Setting up a resource-monitoring framework with communities is a core activity (Moriarty, 2003:91, Maganga, et. al, 2002:920, McDonnell, 2008:138, Moriarty, et. al, 2004:14).

It is critical to integrate water, sanitation, and environmental management. This principle is widely and strongly supported. IWRM can be strengthened through the integration of Environmental Impact Assessment (EIA), social impact assessment, water resources modelling and land-use planning. The above studies could be combined with multi-criteria analysis, a water poverty index and a climate vulnerability index (McDonnell, 2008:139). “A catchment or watershed approach also implies that water should be managed alongside the management of co-dependent natural resources, namely, soil, forests, air and biota” (GWP, 2004). The principle of catchment protection resulted in the establishment of Environmental Protection Agency (EPA) in Ghana and the Water Resources Board in Malawi. Most governments now acknowledge this principle. Local authorities have difficulties in protecting catchment areas against industrial and sewerage pollution discharges (Maganga, et. al, 2002:920, McDonnell, 2008:138).

2.5.2 Water allocation to be agreed within a national framework

Decentralisation of water management often takes place without fiscal support and when local institutions with regulatory and pollution control capacity are lacking. These are central challenges faced by local authorities in Ghana and Malawi. Even with the introduction of IWRM, water management remains fragmented among sectors and institutions, with little regard to potential conflicts among social, economic and environmental objectives and users. There are multiple sectoral agencies for water use, including irrigation, municipal water supply, energy, production, and transport. There is typically inadequate interaction between these different sectors and users, although all form part of the same system. Furthermore, in many countries where individual states and provinces have jurisdiction over water in their territory, the same water source will be developed without considering the impact on other states. IWRM calls for holistic management of freshwater and the integration of sectoral water plans and programmes within the framework of national economic and social policy (Visscher, et al., 1999:7, Maganga, et. al. 2002:919, Lloyd, et. al, 2006:39).

The equitable allocation of water resources implies improved decision-making which is technically and scientifically informed and which can facilitate the resolution of conflicts over contentious issues. There are existing tools (e.g. multi-criteria analysis) designed to help decision-making in terms of balancing social, ecological and economic considerations. These tools should be tested and applied in a local government context in Africa which is dominated by political prerogatives (Nyagwambo, 2008:6, Lopez and Chonguica, 2008:5). But broader power relations prevent the easy importation of technical fixes, especially those that might change prevailing water allocations. Balancing social, ecological and economic considerations remains a challenge in Ghana, Malawi and South Africa. In most countries agriculture and industries take the greatest chunk of water resources at the expense of domestic water users, especially poor people (Saravanan, et. al, 2008:12, McDonnell, 2008:139, Lloyd, et. al, 2006:38, Moriarty, et. al, 2004:3, Muller, 2009:184). Without grappling with the political economy of water, IWRM practitioners will continue to misread the context for their interventions and IWRM will continue to fail.

2.5.3 Management needs to be taken care of at the lowest appropriate levels

In many countries there is a heavy dependence on centralised administration to develop, operate and maintain water systems. However, centralised (top-down) approaches to water resources development and management are often inadequate in addressing local water management problems. Proponents of IWRM claim that, while recognising the need for a central mechanism capable of protecting national economic and social interests, the role of central governments needs to change, in order to enable users, local institutions, and the formal and informal private sectors to play a more direct role. The shifts from public to private, developmental to commercialised state, and state-managed to community-managed systems, are some of the latest trends in IWRM implementation in Ghana, Malawi and South Africa (Maganga, et. al, 2002:923, Lloyd, McCarron and Stacey, 2006:13, Moriarty, et. al, 2004:21, Lopez and Chonguica, 2008:6).

The shift is based on the notion that government needs to become a facilitator and regulator instead of a provider. The current trend towards decentralisation in many

countries is based on the view that water resources are better placed at a lower level. Yet in reality, the most appropriate level of water resources management ranges from the household level to the level of international river basin committees, depending on the issue at hand. The important point known as subsidiarity is that consultation, planning, decisions and actions concerning water resource's management should take place as close to the root of the problem as possible, and that higher levels should primarily provide an enabling environment for decentralised and integrated management. Some opponents of IWRM reject this notion of a demand-driven approach and some would argue instead for a supply-led approach based on lowering the cost of implementation, spreading coverage to as many people as possible, capacity building and much more generous subsidies. The unintended consequences of IWRM implementation based on the rubric of decentralisation are manifested in failures in water supply and sanitation delivery.

Nyagwambo (2008:8) argued that separation of water resources management (water resources and regulatory functions) and WASH (Water, Sanitation and Hygiene) as supported by the AfDB and ADF since 2000 as a requirement for decentralisation, contributes to autonomy and accountability at the local level. In Ghana, the management of sanitation is devolved to district assemblies while rural water is devolved to CWSA. In Malawi, the Mpira Water Authority is responsible for rural water supply and sanitation whereas SRWB is responsible for urban water supply and sanitation. In both countries water resources management is not decentralised, but separate institutions such as the Water Resources Commission (Ghana) and the Water Resources Board (Malawi) are responsible for allocating water rights, licenses and regulation of water resources. Community management and community contribution to the operation, installation and maintenance of water resources are some of the issues that make IWRM unworkable in these two countries (Visscher, et al., 1999:8, Maganga, et. al, 2002:923, Lloyd, et. al, 2006:13, Moriarty, et. al, 2004:14).

2.5.4 Capacity building is the key to sustainability

The weakness of IWRM implementation is that decentralisation took place without associated capacity building and fiscal decentralisation. Effective IWRM requires an

enabling environment and conscious and competent actors (Lenton and Muller, 2009:209). Education, skills development, and capacity-building are essential to promoting this. Capacity-building of the organisations involved in IWRM is crucial both for the proper implementation of a project and for its subsequent sustainability. It consists of three basic elements, namely creating an enabling environment with appropriate policy and legal framework, institutional development including community participation, and human resources development and strengthening of managerial systems (Lenton and Muller, 2009:210). In both Ghana and Malawi, institutions responsible for water resources management and WASH find themselves being expected to discharge such responsibilities without preparation and related capacity-building. Other supporters of IWRM are of the view that institutional capacity for water resources management should be developed only when there is clear demand. This view is problematic in the sense that catchment management agencies (CMAs), water user associations (WUAs) and river basin authorities (RBA), which are becoming increasingly popular in the implementation of IWRM, require capacity-building. For this reason, institutional responses will vary from time to time and place to place (Visscher, et al., 1999:8, Maganga, et. al., 2002:923, McDonnell, 2008:140, Moriarty, et. al, 2004:26).

At many levels in the process even at the governmental level, stakeholders lack the necessary knowledge and skills for full application of IWRM. Community stakeholders may not be familiar with the concept of water resource management, catchment management, corporate governance, and their role in these. Many, even in developed countries, do not even know what a catchment or watershed is. The water stakeholders must, therefore, collaborate in designing and implementing strategic elements of capacity building as part of the evolving IWRM process. None of the participants in various IWRM platforms apart from government officials, utility staff, donors and NGOs had adequate knowledge of laws, regulations, institutional frameworks, and water and sanitation prices of their respective countries (Community interviews and Focus Group Discussions (2010, 2012) Maganga, et. al, 2002:923, Lloyd, et. al, 2006:40, Moriarty, et. al, 2004:27).

The availability of information and the capacity to use it to make policy and to predict responses are also essential. This implies, firstly, sufficient information on hydrological, bio-physical, economic, social and environmental characteristics of a catchment to allow informed policy choices to be made; and secondly, some ability to predict the most significant responses of the catchment system to factors such as effluent discharges, diffuse pollution, changes in agricultural or other land-use practices and the building of water retaining structures. The latter hinges on the adequacy of scientific models, i.e., models should be as complex as the problem requires and no more so. It is recognized that the predicting the ecosystem's response to perturbation with reasonable confidence is severely taxing current scientific capabilities, stimulating on-going research (Lenton and Muller, 2009:210, McDonnell, 2008:141, Lloyd, et. al, 2006:40, Moriarty, et. al, 2004:27).

Capacity building categories include education and awareness-raising, about water information resources for policymaking; regulations and compliance; basic infrastructure; and institutional stability. Early and on-going stakeholder collaboration and communication in capacity building is also important from the viewpoint of “levelling the playing field” in anticipation of disputes that may arise. Filling strategic skills/capacity gaps supports IWRM, facilitates dispute resolution, and builds practical understanding of the scope of sustainable natural resource development challenges and opportunities (Saravanan, et. al, 2008:12, McDonnell, 2008:141, Moriarty, et. al, 2004:24).

2.5.5. Involvement of all stakeholders is required

To ensure that water resources are developed and managed properly, it is important to involve all stakeholders as much as possible and practicable. This involves enabling the coordination and collaboration of different user's groups (i.e. domestic, irrigation, industry, recreation, and the environment). These stakeholders should have a common platform for decision-making where they can voice their concerns and ideas, and can discuss and vote on measures to be taken and activities to be developed to manage the resource. It is important that stakeholders have access to information and can play a meaningful role in decision-making, and receive help in order to make their case. In the

DWSS sector we are already seeing a positive trend in which the idea of community participation, often still implying provision of physical labour, food and shelter, is changing towards community management, empowering communities to take things in hand and claim their role in decision-making. In most of the case studies of IWRM, Lenton and Muller (2009:214) highlighted that the water-centric nature of IWRM poses problems for participation by various interests groups. The multitude of challenges faced by various stakeholders, other than “water experts” from state water institutions, remains prevalent in Ghana, Malawi and South Africa (Visscher, et al., 1999:9, Saravanan, et. al, 2008:12, Moriarty, et. al, 2004:24, Lenton and Muller, 2009:214).

IWRM also suggests that water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels. Participation by all stakeholders whether public or private, or communities or NGOs, with special attention to the problems of women and poor people should be encouraged (Guerquin, et al., 2003:29). All stakeholders should be involved in decision-making with regards to the goals of IWRM. An important element of the dialogue and its participatory approach is the respect for the views of others (Woodhill and Roling, 2002: 7, Saravanan, et. al, 2008:11, Moriarty, et. al, 2004:24).

Full participation by all stakeholders should include workers and the community. This will involve new institutional arrangements. As much as WUAs, WATSAN and other stakeholders are encouraged to participate in local IWRM platforms, none of these structures are represented in the EPA and WRC (Ghana) and WRB, SRWB, and Mpira Water Authority (Malawi). Organised labour federations are equally not represented in any of the above structures. There must be a high level of autonomy, but this must at the same time be associated with transparency and accountability for all decisions (Nyagwambo, 2008:8). Care should be taken to ensure that those participating in any catchment management structure represent a designated group or sector of society. For instance there is a representative of traditional leaders who is a member of the WRC in Ghana. It is also important to ensure that representatives provide feedback to the constituencies they represent. IWRM seeks to combine interests, priorities and disciplines

as a multi-stakeholder planning and management process for natural resources within the catchment ecosystem, centred on water. Driven bottom-up by local needs and priorities, and top-down by regulatory responsibilities, it must be adaptive, evolving dynamically with changing conditions (Saravanan, et. al, 2008:11, Jayyousi, 2007:336, Moriarty, et. al, 2004:24, Lenton and Muller, 2009:215)

Adoption of the best existing technologies and practices should include management instruments. Professional associations like IWA are primary sources of knowledge on BMPs (best management practices), and BAATs (best appropriate affordable technologies). Multi-stakeholder, consensus-oriented forums for IWRM should avoid lowest-common-denominator solutions through adherence to BMPs and BAATs that are adaptive to local needs (Saravanan, et. al, 2008:11). Mukhtarov (2009:5) noted that IWRM has a technical rather than social focus, lacks equity and social justice and is difficult to put into practice. When conducting an analysis of the practical nature of IWRM, its techno-scientific nature and the extent to which social and environmental issues are ignored in various IWRM platforms, is one of the key tools used in this study (Focus Group Discussion, 2010 and 2012, Lenton and Muller, 2009:214).

2.5.6 Efficient water use is essential

Domestic water supply and irrigation systems often face major losses, with leakage percentages of over 50% and 70% respectively. Efficiency of water use should be optimal, minimising water losses during transport, storage and use. Reducing water loss involves aspects related to design, construction and operation and maintenance systems, as well as user behaviours such as leaving taps open or not repairing them. Enhancing efficient water use may also include demand management, re-use, and introduction of water-saving measures. Proponents of IWRM hold the view that implementation of IWRM could reduce water losses and promote efficiency. Water rationing, together with disconnections and demand management in both Malawi and Ghana, are examples of a link between IWRM and water efficiency (Visscher, et al., 1999:9, Mukhtarov, 2009:6, Moriarty, et. al, 2004:24).

According to proponents of IWRM, the recognition of water as an economic good is central to achieving equitable allocation and sustainable usage. Water allocations should be optimised by benefit and cost, and aim to maximise water benefits to society per unit cost. For example, low value uses could be re-allocated to higher value uses such as basic drinking water supplies, if water quality permits. Similarly, lower quality water can be allocated to agricultural or industrial use. Even the Mpira Water Authority in Malawi restricts supplies to communities that waste water allocated in public stand pipes and boreholes in order to promote water efficiency, reduce un-accounted for water use, and encourage responsible use of water (Focus Group Discussions, 2012, Maganga, et. al, 2002:920, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:8).

2.5.7 Water should be treated as having an economic and social value

Proponents of IWRM (Moriarty, et. al, 2004:8) promote the view that water is recognised as having both a social and economic value. Water is considered a social necessity and therefore a basic right for all. On the other hand water also has an economic value. The supply of sustainable water and the disposal of sewage have a cost, and systems can only be maintained when this cost is covered, either through donations, subsidies or by “user contributions” (Maganga, et. al, 2002:924, Jayyousi, 2007:329, Lloyd, et. al, 2006:41). They further believe that when treating water as an economic commodity, optimum use should be made of market-based instruments, like the “user pays” and “polluter pays” principles, if practical. The charging mechanisms adopted must be appropriate and reflect local socio-cultural and economic conditions. Redefining the concept of water as an economic commodity operationally includes shifting the emphasis from supply to demand-management principles. In most countries, supply-led water and sanitation delivery has since been replaced by water demand management (Visscher, et al., 1999:9, Bruschweiler, 2003:6, Jayyousi, 2007:329, Lloyd, et. al, 2006:41, Moriarty, et, al, 2004:8).

Proponents further argue that water has an economic value in all its competing uses and should be recognised as an economic good. Different interests with regards to economic, social, and health security needs to be addressed. In most instances economic interests,

value for water and commodification receive more attention from policy makers as compared to social, health and environmental issues (Woodhill and Roling, 2002: 7, Maganga, et. al, 2002:924, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:8).

The principle that water provision should be so priced so as to discourage wasteful use, while ensuring the right to a necessary minimum for all is concerned with the pricing of water to ensure waste minimisation and a most effective use of limited resources. It should not be confused with the current emphasis in community water supply on cost recovery. Clearly money paid for water can be used for cost-recovery and for operation and maintenance, but the underlying principles are very different. In addition, given the relatively 'fixed price' (inelastic) nature of demand for domestic water, and the widely held belief that access to domestic water is a human right, there are good reasons for not trying to price domestic water at a level that ensures anything other than basic system maintenance. The pricing of water and sanitation services reflects the views of the AfDB, AWF and ADF that the poor already pay more for water than the rich and that hence the poor are willing and able to pay for water and sanitation services that are sustainable without subsidies to the operating and maintenance costs (AWF, 2009, Moriarty, 2003:95, Maganga, et. al, 2002:924, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:8).

While a number of existing economic tools for domestic water services, such as stepped tariffs, may also seem initially promising for IWRM purposes, they should be used with care. Stepped tariffs, for instance, have the problem in that where supply is met in part by water vending, the high tariffs charged to vendors will be passed on to their largely poor customers, as is the case in Accra, Ghana (chapter 5).

A second, more general argument against trying to impose user charges to minimise waste is that on their own, they do nothing to encourage service providers to improve efficiency, aside from assigning a higher unit cost for higher levels. Whether this in turn leads to more efficiency depends upon the price elasticity; as the case of Durban shows, those with high levels of consumption have a very low elasticity, so price increases do not by themselves generate substantial water conservation if the overall price remains low

and the structure of high-volume water consumption (e.g swimming pool refilling in a city like Durban) remains intact.

Given these concerns, and the fact that domestic use is typically small, it is questionable whether pricing in the domestic water sector should be used as an economic measure to limit domestic water consumption. Where the sector can play an important role is in ensuring that other, non-domestic uses (such as water used for irrigation) are charged at a realistic rate. Equally, where private sector providers are involved, charging high bulk purchase prices for water rights, while capping volumetric charges to individual households, may provide a powerful incentive to maintain systems adequately (Moriarty, 2003:95, Jayyousi, 2007:329, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:8).

The full-cost pricing strategy applied to the system as a whole, should be complemented by targeted subsidies according to the IWRM approach. This principle was strongly recommended by the World Water Council, World Bank, UNDP, the Global Water Partnership at The Hague, the rationale being that users do not value water provided free or almost free and therefore have no incentives to conserve it. Wide support for this principle was engendered, but it also encountered significant opposition from those who felt that the interests of the poor might not be sufficiently protected, even under an associated subsidy system, however well-designed. “Targeting” water consumption for poor people is especially difficult given that means-testing (checking recipient income) is highly subjective.

The opposing view is that full-cost pricing, when applied in its narrowest sense, offends the principle that water is a public good, a human right, and not simply an economic good. The economic sustainability of water and sanitation services depends largely and appropriately on the recovery of costs through user-fees or tariffs that are equitably assigned based on ability-to-pay. Under-served or un-served, marginalised users in many places already pay high financial costs of not having safe piped water, because they are forced to pay for water trucked-in by suppliers. This water may be of dubious quality yet is expensive. In Ghana users are not provided with subsidies and they also need to pay

operation, maintenance fees and contributes towards installation fees (chapter 5), whereas in Malawi, households getting services from Mpira Water Authority pay about K50 for collecting water either in a community standpipe or a borehole while those who get access through SRWB pay about K4000 per month. Full cost pricing is encouraged in Africa and communities are resisting this tendency (Mukhtarov, 2009:7, UNDP, 2008, Maganga, et. al, 2002:920, Bruschweiler, 2003:6, Jayyousi, 2007:329, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:18).

2.5.8 Striking a gender balance is essential

A review by the World Bank of 121 water projects showed that ensuring women's participation in decision-making positively affects both project quality and sustainability. The impacts of water and sanitation on other sectors such as irrigation, etc. will be a subject for further investigation using the case countries. This view is supported by AfDB's policies on rural development, gender, IWRM and poverty alleviation, but the impact of these policies on water and sanitation projects funded by AfDB is still expected to be realised more than 10 years since the publication of the above policies (Bruschweiler, 2003:8, Moriarty, et. al, 2004:25, AfDB, 2010).

Implementation of IWRM at a local level tends to ignore the fact that communities, organisations and groups involved in and/or benefiting from a project are not homogeneous and do not have the same interests. They differ in gender, and in economic and cultural backgrounds (e.g. religion, ethnicity, class), and these differences often imply different needs and perspectives, among others related to the use of water. This often has implications not only for the use of water supply facilities, but also for operation, maintenance and management. In particular the tasks and responsibilities (and hence needs and interests) of men and women can differ considerably, and projects have to take special measures to involve women. There is evidence of involvement of women prior to the adoption of IWRM as a policy in Malawi. Women are part of tap committees, borehole committees, but none of them form part of Mpira Water Authority, SRWB and other important institutions as decision makers, but only as low-ranking employees (Visscher, et al., 1999:10, Moriarty, et. al, 2004:24).

There is no disagreement that women play a central part in the provision, management and safeguarding of water. Ideally access to and use of resources should be equitable among stakeholders, independent of gender. However, this is rarely the case and it is not possible to redistribute land rights in the short term. The same applies to water rights, except where it is common property (e.g. for drinking and domestic use and for livestock). It is important to indicate that the private property rights dispensation in most countries tends to ignore the rights of women as custodians of water resources. However, in the dialogue process, it should be possible to address the issue of unequal access to land and water and design strategies to ensure that the interests of asset-less people are not neglected, as is the case in Africa (Woodhill and Roling, 2002: 7). It has become a commonly accepted fact that the gender issue remains critical for IWRM to be realised in a sustainable manner (ECA, 1999:15). Lack of convenient access to water and sanitation adds enormously to women's domestic burdens. It also disproportionately affects their health and that of their children. The water and sanitation sector has long recognised the major benefits that improved basic services can bring to women's lives and to girls' education when they are freed from the daily chores of fetching water. Gender perspectives are comparatively well developed in the sector and are seen as an entry point for poverty alleviation as well as bringing health and lifestyle benefits (Jayyousi, 2007:336, Moriarty, et. al, 2004:24).

The WATSAN sector is most critically affected by other water uses in terms of competing or conflicting use and pollution. This first affects the quantity and reliability of domestic water supplies, and secondly the quality and associated costs of treatment. The role of women as custodians and guardians for food and water requirements for the household should be taken into account by planners and designers of water schemes. It should be realised that identifying and defining the needs of women would promote more effective public participation and community involvement which in turn would help towards achieving better success in IWRM. Women should be encouraged to be motivators, and they should be fully involved in maintenance and operation of water development schemes (ECA, 1999:15). The implementation of water projects would become more

useful in reducing the hardships of women and bringing about the well-being of communities in areas of health, education and economic fields (Moriarty, et. al. 2004: 24).

According to Moriarty (2003:94) the principle which states that gender and equity issues must be addressed throughout the project cycle represents a change in emphasis and broadening of interest from the original Dublin declaration, with its focus on the role of women, to a wider gender focus that seeks to identify and cater for the different needs of men and women, and in particular of poor men and women. It emphasises that burdens and benefits are shared equally between men and women, necessitating particular efforts to enable women to claim their right in decision-making. Men and women use water for different activities. The issue of socio-economic equity in allocation of water resources is a central concern to practitioners in community water projects. Whether the poor use water exclusively for drinking, or for a range of small-scale productive activities, they tend to lack the political strength to make their voice heard in official water allocation bodies. Where such bodies exist, advocating for sufficient and fair water rights within such bodies can be an important aspect of a community water supply programme (Moriarty, 2003:94, Moriarty, et. al, 2004:24).

The Dublin Principles of IWRM, and the eight principles developed later were partially utilised in the water and sanitation projects that the African Development Bank is funding or has funded (Moriarty, et. al, 2004:24). As much as the focus in this thesis is on decentralisation and recognition of water as an economic good, where one considers other factors at play such as water resource development, environmental management, sustainable development issues, gender mainstreaming, water demand and efficiency and participation, they serve to highlight failures in the two aforementioned principles i.e. decentralisation and recognition of water as an economic good. Given these failures, one response by civil society addressed in future chapters is the recognition of water as a human right as enshrined in Ghana's (implied in water and sanitation policies and still not mentioned in the constitution), Malawi's (section 30) and South Africa's

constitutions(subsection 27) and that of many other African countries (Focus Group Discussions, 2010 and 2012).

2.6 Water is a basic human right

Muller (2009:179) has pointed out the weakness of IWRM in ignoring the social dimensions of water and the recognition of water as a human right supported by constitutional obligations in countries such as South Africa, Ghana, Malawi and many others. In addition to critical domestic requirements, there is an increasing recognition of the important role in economic well-being and poverty reduction that a supply of water for productive use can provide at the household level (Bruschweiler, 2003:7, Jayyousi, 2007:329, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:25).

Firstly water is crucial to keep the human organism alive and healthy. This takes 30-50 litres of clean water, per person per day, according to the World Health Organisation (depending on climate and other activities). However, having enough water to drink but not enough to wash can still lead to ill health or death, perhaps not as directly but with no less certainty than a lack of drinking water. Hence the need for water for bathing and personal hygiene (such as hand washing after defecation) is always essential.

Domestic water is also critical for waste disposal through sewers or into septic tanks or latrines. All of these uses, as well as small quantities for cooking and cleaning/washing are so essential to a human's well-being that they are universally acknowledged as being both a need and a right. While planning for access and use has to be integrated with other sectors and users, water for domestic purposes is universally acknowledged as having top priority in water resource allocation. Moriarty (2003:85) noted that there is a need to ensure the right of access of communities to a fair share of water resources for all their livelihood needs, domestic and productive, and steps should be taken to make the use of this share as efficient, effective and sustainable as possible. In Muller's (2009:180) analysis, provision of 25 litres per person per day by the South African government is based on the recognition of water as a human right to meet basic human needs. In both Ghana and Malawi, access to water is guaranteed in the constitution and policies, but

providing subsidies on the scale found in South Africa remains a dream. The reason is not physical scarcity, but institutional and policy gaps that contributes to governments paying only lip service to indigent households (Bruschweiler, 2003:6, Jayyousi, 2007:338, Lloyd, et. al, 2006:41, Moriarty, et. al, 2004:25).

2.7 Impacts of water and sanitation on other sectors

The impacts of water and sanitation on other sectors ranges from competition involving various stakeholders within an IWRM platform, failure to control pollution by state institutions at the national level or assist local institutions to do so, lack of reliability of supply and keeping ecological and human health reserves, failure to pay attention to social dimensions, lack of reliable and sustainable financing and to paying only a lip service to women's role in water management. These are negative impacts of implementing IWRM as a condition for donors to commit funds to developing countries. These negative impacts are visible in case studies of Ghana (chapter 5), Malawi (chapter 6) and South Africa (chapter 7).

2.7.1 Competition

Water is a critical economic resource and hence often in great demand. As a result competition exists on many levels within and between sectors. Most of the examples of conflicting water-use impacting on domestic water supply needs come from the agricultural sector (water for irrigation) in South Africa, Malawi and Ghana. This competition for allocation and the priority normally given to domestic use can result in conflict, especially when urban reticulation systems are accused of “losing” as much as 50% of the piped water and using water wastefully (Bruschweiler, 2003:7, Pahl-Wostl, Gupta and Petry, 2011, Lloyd, et. al, 2006:49, Moriarty, et. al, 2004:15).

Water users involve the following in most countries: Agriculture, Water Supply and Wastewater, Mining, Industry, Environment, Fisheries, Tourism, Energy and Transport. Each of the water uses identified above has valuable positive impacts. Most also have negative impacts which may be made worse by poor management practices, the lack of regulation and/ or lack of motivation due to the water governance practices currently in

place. At present, water management within government structures is distributed across many agencies and tends to be dominated by sectoral interests. In Ghana there are district assemblies, a Ministry of Food and Agriculture (MOFA), CWSA, GWCL, PURC, a Ministry of Health, Ghana Health Service, EPA, a Ministry of Fisheries, a Department of Cooperatives and Community Development (DCCD), the Volta River Authority (VRA), Departments of Hydrology and Meteorological Service, a Council for Scientific and Industrial Research (CSIR), the Water Research Institute (WRI), WRC, Minerals, Forestry and Lands Commissions, Traditional Authorities, WUAs, WATSAN as stakeholders in the water and sanitation sector. In Malawi, stakeholders includes the Ministry of Irrigation and Water Development (MIWD), WRB, Water Boards, local assemblies, Ministry of Agriculture, Ministry of Irrigation, Ministries of Natural Resources, Health, Meteorological Services, NGOs, private sector and Mpira Water Authority (Focus Group Discussions, 2010 and 2012, Maganga, et. al, 2002:924, Pahl-Wostl, et. al, 2011, Lloyd, et. al, 2006:49, Moriarty, et. al, 2004:16). South Africa also has a tripartite water power structure, ranging from the Department of Water Affairs to Catchment Agencies to municipalities; the case study of Durban focuses attention on the latter because of its overarching importance in water delivery in the city's peri-urban and rural areas.

2.7.2 Pollution

Pollution of sources from which domestic supplies are derived is a critical issue, leading in the worst case to serious health problems and at best to increased treatment costs. In both Ghana and Malawi pollution control is still weak on the part of government at a local level (Maganga, et. al, 2002:924, Capnet, 2006). Pollution is a problem for water from both surface and sub-surface sources, although it is the former where the problem is more widely recognised. The quality of river water can be negatively affected by pollution from either agriculture or industries (pesticide or fertiliser runoff, discharges of hazardous materials etc.), or indeed untreated human effluent which is the case in Accra where 32 out of 35 waste water treatment plants (WWTP) are not functioning (chapter 5). Equally, aquifers can be polluted by excess fertiliser application, or improper disposal of hazardous materials from industry or from municipal dumping or poorly constructed

septic tanks. Pollution of the Lilongwe River and a lack of waste disposal facilities in Balaka in Malawi are examples of failures of the IWRM decentralisation mantra (Bruschweiler, 2003:7, Pahl-Wostl, et. al, 2011).

Both Ghana and Malawi have groundwater aquifers that represent a huge water resource. The total volume of groundwater is much greater than the water that flows through the world's rivers in a year in most countries. In chapters 5 and 6, the capacity of lakes and aquifers is used to illustrate that both countries have enough water resources, but poor governance under the IWRM rubric exacerbates scarcity in rural areas. In both countries it was established that not all groundwater is renewable, and some can be renewed only over long periods. Aquifers are porous rocks that are deep layers of gravel or sand that contain water. They can interact with rivers, wetlands, and the seas around coastal areas, recharging these because a layer of soil and rock protects it from direct human impacts. Such groundwater is often of high quality and suitable for drinking. But shallow aquifers, which are the most accessible and the most used, quickly become polluted. In some areas, over-exploitation of groundwater has led to soil subsidence that is lowering the soil surface. Even if all negative impacts were stopped, it could take hundreds of years for the aquifers to recover. With poor water governance under the rubric of IWRM, more and more aquifers will remain polluted (Guerquin et al, 2003:30, Bruschweiler, 2003:7, Pahl-Wostl, et. al, 2011, Moriarty, et. al, 2004:4).

Groundwater pollution problems can be particularly difficult to identify and then to remedy, especially when industrial pollution requires very costly treatment. In Accra, only private WWTPs are functional; 32 government plants were forced to shut down after they were handed over to local authorities as a result of decentralisation. Finally, the environment itself can be an important source of pollution in water sources, with arsenic contamination of groundwater in Bangladesh perhaps the most widely known recent example (Brown and Clarke, 2007).

The fact that the water supply sector is itself most often responsible for polluting drinking water sources, especially for downstream users, highlights an internal management

problem or discontinuity in management structures. The discharge of faecal matter from Kumasi Ventilated Improved Pit latrines to rivers and closure of WWTPs was meant to be addressed by the Sanitation Improvement Project (SIP) financed by the AfDB in Accra. But Ghana is an example of failure of local authorities to address these problems, regardless of the amount of money invested. Improperly treated human waste is a major source of environmental pollution leading to problems for both other humans and the environment as a whole. Pollution of rivers and streams by untreated or inadequately treated municipal and industrial effluents can render the watercourses unsuitable for use as sources of irrigation-water and damage aquatic ecosystems. Compiling a state of local environmental report or state of rivers report remains the responsibility of National Departments of Environment in South Africa, Ghana and Malawi. Durban and Accra are some of the few cities in Africa with local environment departments, suggesting that water service providers are not regulated at a local level and therefore fail to account to the promises of IWRM (Brown and Clarke, 2007, Moriarty, et. al, 2004:16).

The reuse of municipal wastewater for irrigation in the peri-urban zones of many developing country cities has both positive and negative impacts. The recycled water and nutrients are important for water conservation, but the health risks are significant unless there are tight controls. Not only are the farmers themselves exposed to high risk from pathogens, but also their produce is then exported to a wider public which may also suffer. The eThekweni Municipality is exploring projects through which nutrients are recovered from urine and waste water is recycled and re-used (Personal Communication with Water Officials, 2012, Brown and Clarke, 2007, Bruschweiler, 2003:7).

2.7.3 The need for reliability and buffers

It is frequently and wrongly assumed that because allocations for domestic water resources are 'small' they will have little impact on those for other uses. The South African Water Resources Strategy (2004) calls for an ecological reserve in water resources management. South Africa is cited as a good example of full IWRM due to its National Water Act of 1998. This created the Catchment Management Agencies (CMAs). A year earlier, the Water Services Act of 1997 provided a framework for equity,

efficiency and sustainable water management whilst ensuring that pricing economic instruments are included (Moriarty, et. al, 2004:21, Muller (2009:175).

However, because of the critical importance of an uninterrupted supply, the need to safeguard adequate buffers in the catchment or aquifer systems to ensure this supply at all times, and the seasonal nature of much water demand (particularly for irrigation), serious conflict can and will arise around allocations for domestic and other needs. Neither Ghana nor Malawi reserve water for environmental and household needs. Water rationing and restriction in the domestic cycle are common in both countries. Both have dams and impoundments that are not maintained, leading to either de-commissioning or remediation. Rainwater harvesting tanks play an important role during water rationing and drought (Focus Group Discussion, 2010 and 2012, Moriarty, et. al, 2004:21).

This requires attention to the use of social impact assessments, workplace indicators and other tools to ensure that the social dimension of a sustainable water policy is implemented. Objectives include the promotion of equitable access, an enhanced role for women, and the employment and income implications of change. The social dimensions of water supply and sanitation are enshrined in the constitutions of most countries. But the lack of subsidies for indigent households to cover payment of operation, installation and maintenance by households suggests that governments are abdicating their responsibilities and using IWRM as the excuse. The scarcity experienced by rural households in African countries is a manufactured problem, caused by the full cost-recovery philosophy and a view of water as a commodity instead of a public good (Bruschweiler, 2003:5, Clement, Soussan and Mitchell, 2000:3).

In order to ensure the successful implementation of IWRM approaches, there should be a clear, long-term commitment from government to provide financial and human resources support. There is a view that this is complemented by income from a healthy water and sanitation market, especially when local providers of goods and services that support the water sector are active players, and when there is active re-reinvestment in the sector. It is

clear that most countries rely on donors to finance construction, operation and maintenance of water infrastructure.

In contrast, the key argument against IWRM in this thesis is that strong developmental states are supply-led, and support the project of realising water as a human right by disbursing subsidies to indigent households. Such an approach, eschewing cost-recovery and decentralisation in its current form, would go a long way to reducing manufactured water and sanitation scarcity in rural Africa (Brown and Clarke, 2007, Muller, 2009:175).

2.8 Benefits of IWRM

When it works, some of the benefits of IWRM are water security, efficiency and demand management, pollution control, improved waste management and gender mainstreaming. Lack of water security, un-accounted for water, poor pollution control measures and the use of demand management to restrict the poor's access to water are some of the challenges facing Ghana, Malawi and South Africa, preventing them from enjoying the benefits of IWRM. Proponents of IWRM argue that properly applied IWRM would lead to assured water security for the world's poor and un-served. The implementation of IWRM-based policies should mean increased security of domestic water supplies, as well as reduced costs of treatment as pollution is tackled more effectively (Bruschweiler, 2003:5).

Greater integration in management of water resources will also help to reduce conflict among water-users by ensuring agreed efficiency of use in competing sectors. In addition to the physical activities to augment quantity and preserve quality, there may be a need for local management between competing resources, and effective demand management of all water uses. The greatest weakness in Africa is that demand management in the form of water restrictions and rationing which results in vending and disconnections is only felt by the poor and rural inhabitants. This can take the form of simple rationing, or banning of certain activities, but is more likely to be successful where efforts are made to involve communities in the monitoring and regulation of their own water use (Moriarty, 2003:91, Moriarty, et. al, 2004:21).

Demand management in traditional water and sanitation thinking tends to be linked mainly to improving efficiencies in transmission systems. Poorly maintained systems can result in losses of 50% or higher and dealing with these clearly provides an important area for creating extra supply. However, given the reality of competing uses at a local level, it is also necessary, in collaboration with the community, to identify all the uses of water and all the potential actions that can limit excess water consumption within these various uses (Moriarty, 2003:91, Bruschweiler, 2003:7). Major blind spots exist due to the failure to coordinate effectively with other sectors. The issue of wastewater disposal provides a good example. Here, rather than working together with other sectors to exploit a potentially important economic resource, the attitude tends to be one of “out of sight, out of mind”. Implementation of IWRM will correct and minimise wastage, thereby improving sound waste management practices. The decentralisation of this aspect of government responsibility worsened the situation. Institutions that never developed capacity in waste management were all of a sudden expected to discharge such responsibilities (Pahl-Wostl, et. al, 2011, Moriarty, et. al, 2004:19).

Social inclusivity and women’s inclusion in decision-making have been seen as desirable for some time in the water and sanitation sector. Internationally, it is acknowledged that men and women have distinctive roles to play in the management of water resources. The changing of attitudes and long-held practices is understood to be a slow process but the establishment of an enabling environment and working with both men and women to create a gender balance are seen as two important factors in bringing about this change. Gender is increasingly accepted as being more than women’s rights (Visscher et al., 1999:50).

2.9 Barriers to the implementation of IWRM

The barriers to the implementation of IWRM are the willingness to change, the lack of tools and systems for integration, the difficulty of achieving effective water governance, the domination of water administration by water experts, the experts’ lack of knowledge

about water resources, and systemic unsustainability in part caused by high costs of operation and maintenance.

2.9.1 Willingness to change

In the case study countries and indeed across Africa, some government departments, such as Agriculture, do not participate in IWRM since they regard water supply and sanitation as the domain of the Ministries Responsible for Water. Worse, domestic water, sanitation and hygiene responsibilities are often spread over a number of government departments, such as Water Affairs, Health, Local Government, and/or Public Works, and over the last two decades much experience has been gained in practical ways to work together effectively across departmental lines (Cap-net, 2006).

Equally, the WATSAN sector has been focusing on grassroots-led development for decades, and has been at the forefront of decentralisation efforts. More than the other sectors, water and sanitation are local issues requiring local solutions by local people. WATSAN professionals are perhaps more removed than any other water sub-sector from IWRM as it is currently practised. This is because IWRM is managed at the level of the Ministry and not local authorities. At that level it is the Water Resources Departments that are involved in IWRM platforms. In Ghana, it is the WRC that is driving water policy and in Malawi it is the WRB that is most responsible for IWRM platforms.

Local authorities such as local and district assemblies typically focus on the management of the supply system (reticulation) rather than the resource-base itself, which tends to be taken for granted. Equally, they are already involved in trying to work together effectively with a range of actors from different backgrounds many of whom have nothing to do with water at all. A focus on health has led to a number of failures, perhaps most importantly the stubborn blind spot that persists as far as productive uses at the household level are concerned. Work is difficult to coordinate with other water sub-sectors, environment, food or agriculture or other sectors that are equally often divided over the departments. Local participation should be backed by close cooperation at higher institutional levels between Departments or Ministries Responsible for Water, Sanitation,

Environment and other related functions, and between decision-making bodies within the catchment or hydro-graphic basin (Bruschweiler, 2003:6, Lloyd, et. al, 2006:50).

2.9.2 Lack of tools and systems for integration

Because IWRM is a philosophy, the core of this challenge is finding effective tools and processes to achieve greater coordination and cooperation without incurring such high transaction costs that the entire process becomes wasteful and results in the following matters. A notion persists that there is a failure on behalf of the WATSAN sector to engage meaningfully with other sectors involved in IWRM. What is sharpening this notion is the lack of models of how to go about pursuing integration together with a critical absence of both policy and the personnel to implement it. Conflict between decentralisation and the desire to maintain central power and influence is also a grey area. The people in rural areas that need to negotiate for water allocation are poor and face the difficulty of getting the large, diffuse group represented by the WATSAN sector to interact meaningfully with the small, well-organised lobbies of big agriculture and industry. Another complicating factor is that institutional development is perceived as tokenistic rather than real. It appears to be merely tagged on to existing technically-oriented programmes with only marginal amounts of resources allocated. Another factor is the unwillingness to deal with the implications of the critical need for reliability (and hence often large reserves and buffers) in domestic supplies, and the implications this has for the availability of water for other sectors (Clement, et. al, 2000:5, Lloyd, et. al, 2006:50, Slootweg, 2009:3).

IWRM could, on the one hand, increase co-operation and improve coordination between the various departments (i.e. through the introduction of inter-departmental, or regional task teams), but on the other hand it could disrupt systems that have been in existence for a long time, and therefore meet with a lot of frustration and negativity of the officials within the various departments. Furthermore, institutional reforms are often very costly, costs that have to be won back through improved efficiency and effectiveness of the new IWRM-based system (Pahl-Wostl, et. al, 2011, Lloyd, et. al, 2006:50, Slootweg, 2009:4).

2.9.3 Achieving effective water governance

According to Rogers and Hall (2003:28) water governance should enhance the effectiveness of IWRM. The IWRM approach eschews politics and the traditional fragmented and sectoral approach to water and makes a clear distinction between resource management and the water service delivery functions. It should be borne in mind, however, that IWRM is itself a political process, because it deals with re-allocating water, the allocation of financial resources, and the implementation of environmental goals. There is a general agreement amongst water professionals that IWRM provides the only viable way forward for sustainable water use and management, although there are no universal solutions or blueprints and there is much debate on how to put the process into practice. IWRM is not applied in a vacuum and the broader picture, as described by governance, provides the context in which the IWRM approach can be applied. IWRM is able to cope with the multi-functionality of water, its many uses and users, and addressing the issues from a biophysical, socio-economic and institutional systems perspective (Bruschweiler, 2003:3, Pahl-Wostl, et. al, 2011, Lloyd, et. al, 2006:53, Slootweg, 2009:4).

2.9.4 Domination of water administration by water experts

In many cases, governments are managing water through the efforts of individual departments and there is no coordination between planning and operation. Close cooperation with environmental departments is also lacking and provinces that ignore natural riparian zoning of surface water and ground water are in charge of administration. To make matters worse, women and men in communities dependent on water administration for their lives and daily bread. It is observed that people, who are the most important beneficiaries in water and sanitation schemes, do not participate in decision-making.

One reason for this is that even though IWRM looks beyond sector boundaries, its implementation is limited by sector boundaries; this in turn limits civil society participation since specialised water advocacy groups made up of local residents (not imported NGOs) are in many African settings quite rare. Sectors outside the water sector may be totally ignorant of the principles of IWRM. There are few mechanisms to get a

foothold for IWRM in these sectors. The water and sanitation policies of Ghana and Malawi highlight a number of national and local stakeholders that ought to participate in IWRM platforms. In practice the Ministry Responsible for Water and Water Resources Departments and themselves, institutions remain the only institutions that participate in IWRM platforms. As a result technical and engineering issues are tabled and scarcity of water is perceived as a hydrological matter whilst social, institutional and economic scarcity issues are ignored (Oda, 2003:37, Lloyd, et. al, 2006:53, Slootweg, 2009:3).

2.9.5 Lack of quantitative knowledge on water resources

If you ask WRB staff about the number of boreholes in Malawi, it is difficult to get an exact number from the state institution that is responsible for granting drilling licenses. The number of dams in Malawi is estimated at 750, as indicated in chapter 6, but those controlled by industries, NGOs and other non-state actors are not known to government, including WRB. The number of dams facing siltation, sedimentation and high precipitation problems is also not clear. This is because of the failure to assess the value of water and environment in the past that caused a serious lack of quantitative knowledge on fresh water ecosystems. Likewise, little incentive has been given to promote innovations in water-saving technology (Oda, 2003:38). Slootweg (2009:3) argues that IWRM is a well-developed and highly structured approach, supported by computational frameworks capable of providing quantitative information on dynamic systems, and capable of working on the basis of alternative. However, results on the availability of useful water data is disappointing in Ghana and Malawi as pointed out in chapters 5 and 6.

2.9.6 Sustainability, operation and maintenance

The fundamental weakness of IWRM implementation in water supply and sanitation is a lack of operation and maintenance of water and sanitation infrastructure that results in deterioration. The other equally important sustainability weakness is the failure to factor in appropriate institutional arrangements, impacts on people and ecosystem, in project design and infrastructure development. Government agencies that are technically-oriented have little experience in social, economic and environmental issues which affect

the sustainability of projects in the long run. A number of boreholes constructed during the era of United Democratic Front (UDF) (1994-2008) in Malawi were already in bad shape when Democratic Progressive Party (DPP) took over after a disagreement with former UDF chairman Bakili Muluza. Most of the boreholes were operated and maintained by communities and therefore faced challenges in getting spare parts from other countries. In nations with weak environmental policies or laws, environmental consideration in IWRM plays a small role in decisions about water allocation, water quality management, source protection, or the protection of water-dependent ecosystems and therefore becomes unsustainable. IWRM itself is not embedded in any legal procedures and consequently cannot be enforced. The fact that only 3 out of 35 WWTPs in Accra, Ghana are operational means that the sustainability of water schemes is compromised. Water pollution is also a result of such water-system maintenance failures (Clement, et. al, 2000:6, Lloyd, et. al, 2006:54, Slootweg, 2009:3).

2.10 Implications for the implementation of IWRM

The changes required by IWRM implementation are greatest for those who currently work most narrowly within a sectoral remit. IWRM requires adjustments in institutional set up, harmonisation of the institutional arrangements to specific requirements of each local community (other than those prescribed by donor agencies), and strong management capacity and not just technical capacity (Clement, et. al, 2000:7, Lloyd, et. al, 2006:34). The current “water and sanitation sector” should no longer be looked upon as a separate autonomous sector within other organs of state. The focus should shift to one of scale and type of supply, with those working in the current WATSAN sectors teaming up with others involved in efforts to tackle poverty through the effective use of water resources.

The rights of the poor (and indeed of all people) to an equitable share of available resources will require both legislation and new models of stakeholder involvement, as well as concerted advocacy. Only when this right has been satisfied to an acceptable level of certainty should excess resources be made available for other uses. The institutional transformation should be based on subsidiarity and stakeholder involvement that could

take place in a decentralised or centralised institutional mechanism. In Ghana and Malawi the Ministry of Housing, Water Affairs and Public Works (Ghana) and the Ministry of Irrigation and Water Development remain sector leaders. Even in South Africa the Department of Water and Sanitation is regarded as a sector leader, although sanitation was placed under the Department of Human Settlements in President Zuma's first term in 2009. IWRM remains a water sector initiative and stakeholders are "invited" by Ministries Responsible for Water to participate in such platforms (Clement, et. al, 2000:8 Jayyousi, 2007:336, Lloyd, et. al, 2006:53).

A completely new approach to dealing with wastewater will be required. This should be one that focuses on waste as a resource, and that seeks to maximise the value of the resource to the community as a whole. This could include the use of grey water in flushing toilets or reducing the amount of cistern water from 12 litres to at least 6 litres and also encouraging the re-use of water, as explored by the city council in Durban. The use of waste to generate energy and freshwater in rivers to generate hydropower has perpetuated scarcity in many countries. Communities that are displaced as a result of the construction of hydropower dams in most instances do not get access to electricity and even water that is pumped easily with the availability of electricity (Pahl-Wostl, et. al, 2011).

The requirement of IWRM to allow stakeholder representation will require wholesale re-orientation in many existing organisations used to seeing themselves as "experts" and "managers". They will need to change to being facilitators, enablers, and regulators. This will require a shift in the skills base, with a particular focus on the use of participatory techniques. According to Oda (2003: 37), IWRM is intended for abolishing sectionalism that hampers the resolution of water problems and creating a momentum and building systems for the integrated coordination of environment, development, land and resources. The participation of ordinary citizens and other people affected in decision-making concerning shared river basins will contribute to the strengthening of river basin management. This plays a significant role in building the foundation on which to base the improvement of the decision-making processes for implementing policies through

information disclosure (Oda, 2003: 39, Clement, et. al, 2000:10, Dauda, 2006:291, Lloyd, et. al, 2006:56).

Institutions that prescribed IWRM as a condition for funding in Ghana and Malawi did not realise that IWRM can only be built on experimentation. However, much of the philosophy is based on liberalisation of the water sector and a narrow technicist form of environmentalism driven by the WTO, UN bodies, the World Bank and AfDB (Bernstein, 2002, Harvey, 2007). The outcome of experimentation in Europe may be different from Africa, given extremely different local conditions. There are no transferrable blueprints, regionally, national, or even sub-nationally. People must be given the freedom to experiment and find solutions that suit them and their environment. Donors, in contrast, prescribe the most formulaic version IWRM as a condition for funding, including outcomes that are justified only through Logframe evaluations. In that regard, community self-management and even forms of privatisation that might have worked in other countries are not suited to conditions in Africa. Hence, it is fair to call the resulting water system breakdowns a form of “manufactured scarcity” (Lloyd, et. al, 2006:57).

Generating a new IWRM, even with donor prodding, can be a long process and will necessarily entail extensive consultations with affected agencies and the public. In Malawi, attempts to replace the Water Resources Act of 1969 have been under discussion since the UDF took over from Dr Kamuzu Banda in 1994. The People’s Party (PP) presented a draft Water Resources Bill to Parliament in 2012. Attempts to promulgate this Bill during DPP rule under Bingu wa Mutharika (2004-2012) did not materialise (Lloyd, et. al, 2006:57).

Bringing principles of IWRM into a water sector policy in a low-income African country and achieving political support may be challenging, as hard decisions have to be made. Because of these hard decisions, it is not surprising that major legal and institutional reforms are unlikely to take place until serious water management problems have been experienced. In some cases, IWRM may be seen as a threat to donor-supported capital investment programmes. Some developing countries tend to be more concerned with

increasing supplies through new infrastructure rather than with water efficiency or managing water demand. Indeed they fear that the new agenda of IWRM will lead to a reduction in capital investment for such projects. Water supply projects lack a sanitation component and did not meet the basic needs of the urban poor, informal settlements and rural areas. Most of the projects funded by the AfDB were implemented piecemeal, driven by political expediency and orientated to the short term (Clement, et. al, 2000:10, Dauda, 2006:291).

There is a view that IWRM implementation brings about a changing of attitudes. Officials are becoming more aware of the need to manage resources efficiently. Officials now see to it that the construction of new infrastructure has to take into account environmental and social impacts and the fundamental need for systems to be economically viable for maintenance purposes. However, they may still be inhibited by the political implications of such a change. The process of revising water policy is therefore a key step, requiring extensive consultation and demanding political commitment (Dauda, 2006:292).

Water legislation converts policy into law and should do so by clarifying the entitlement and responsibilities of users and water providers; clarifying the roles of the state in relation to other stakeholders: formalisation of the transfer of water allocations; provision of legal status for water management institutions of government and water- user groups; and ensuring sustainable use of the resource (Lloyd, et. al, 2006:57). Most countries adopted IWRM-related water policies, but aligning such to water laws remain a challenge. As developing countries, governments in Ghana and Malawi consider water resources planning and management to be a central part of government responsibility. There is also a shift in management of water resources, water supply and sanitation from the state to the private sector as required by donors. This view is consistent with the international consensus that promotes the concept of government as a facilitator and regulator, rather than an implementer, of projects. As indicated in chapters 5, 6, and 8, the governments of Ghana and Malawi were under siege from donors who wanted reforms in the form of privatisation, commercialisation, community management and institutional

shift at all cost. Neither country was ready for such reforms but had to comply with them in order to secure funding (Fuest, 2005:12).

IWRM implementation reduced national governments to mere facilitators and not implementers of water resource management. The challenge is to reach mutual agreement about the level at which, in any specific instance, government responsibility should cease, or be partnered by autonomous water services management bodies and/or community-based organisations. The shift in Ghana from state provision to private sector participation is an example of a high-cost experiment. Community management, separation of water supply from sanitation, provision of rural water supply by different institutions from their urban counterparts are some of the challenges faced by many developing countries (Dauda, 2006:292).

According to the ECA (1999:4), institutional responsibilities for water resources planning and management are usually fragmented among sectoral ministries and administrative agencies. Consequently, wastage of scarce resources does occur. This has been a considerable impediment to achieving progress and to realising IWRM within the sector itself and with other sector development programmes. In order to bring IWRM into effect, institutional arrangements are needed to enable the functioning of a consortium of stakeholders involved in decision-making, with representation of all sections of society, and a good gender balance (Dauda, 2006:292, Lloyd, et. al, 2006:58).

Organisational structures at basin and sub-basin levels are required to enable decision-making at the lowest appropriate level (Pahl-Wostl, Gupta and Petry, 2008:421). Government is expected to co-ordinate the national management of water resources across water-use sectors. The future strategy should focus on carrying out institutional reforms and establishing legal instruments in countries where these have not yet been done. Similarly, steps should be taken by governments to designate the functions of co-ordination and administration of water activities to some national focal point or centre (Pahl-Wostl, Gupta and Petry, 2008:421). Improved co-ordination should at least lead to the development of adequate capabilities for prioritising and formulating long-term plans

with clear guidelines, adequate to enhancing financial management and overall manpower capacity and identifying areas for cooperation, in harmony with national and regional policies and strategies. Institutions, policies and laws to support the implementation of IWRM are in place and underway in Ghana, Malawi and South Africa, but the challenge remains coordination at the local level (ECA, 1999:5).

The concept of IWRM has been accompanied by promotion of the river basin as the logical geographical unit for its practical realisation. The river basin offers many advantages for strategic planning, particularly at higher levels of government, though difficulties should not be underestimated. Groundwater aquifers frequently cross catchment boundaries, and more problematically, river basins rarely conform to existing administrative entities or structures. Approximately half of the world's population lives in river basins shared by more than one country. River basins not only provide for natural ecosystems, but also are overwhelmingly important sources of fresh water. Since interactions between natural divisions in river basins (upstream and downstream, tributaries and mainstreams, land and water, ground water and surface water, etc.) are very close, cooperative management of shared river basins is widely desired. Ghana participates in RBAs and cooperates with neighbours because most of her rivers are shared with Ivory Coast, Burkina Faso, Benin and Togo, but there are tensions between Malawi and Tanzania over the ownership of Lake Malawi (Oda, 2003:38).

2.11 Conclusion

This literature review chapter presented various definitions of IWRM. Critics raised concerns about the very definition of IWRM as a water and sanitation governance model. The various characteristics of IWRM include decision-making, a systematic process and a strategy for reforming water institutions. Others believe that IWRM assists policy makers in decision-making whereas others criticised IWRM for decisions that result in water and sanitation scarcity. The various reasons for introducing IWRM at a global level were advanced in this chapter. This is followed by the four original principles of IWRM as well as those that were developed during the implementation stages of the concept.

It is clear that not all the principles of IWRM are problematic and therefore in the pages that follow, the focus will be on two that continue to cause controversy: recognition of water and sanitation as economic goods, and decentralisation of mandate without sufficient financial resources. There is no disagreement regarding the importance of water as part of the ecosystem as well as the role of women, participatory processes within a catchment or watershed as well as capacity building processes. The efficient water use which led to water and sanitation authorities putting more emphasis on water demand management by poor households is also considered in this and forthcoming chapters.

Various impacts of IWRM can be felt in water sector controversies including competition, pollution, water security, social issues and sustainability. There are certainly benefits of IWRM implementation, such as gender equity and improved waste management. Barriers to the implementation of IWRM were identified to include the lack of willingness to change, lack of tools for integration, domination of the WATSAN sector by experts, poor operation and maintenance, and the two explored in further chapters: cost-recovery limitations and financial decentralisation. The next chapter deal with theories used to deepen the analysis that follows.

Chapter Three

Theoretical framework

3.1 Introduction

In this chapter the theoretical framework used to analyse the implementation of IWRM in Ghana, Malawi and South Africa is presented. The analysis focuses on links between water and sanitation governance, new institutional economics and environmental economics theory. Different scholars overlap in their theoretical analysis of poverty, sanitation, water service delivery, and broader developmental challenges. Some scholars identify themselves as water and sanitation governance theoreticians, some identify themselves as new institutional economists, whilst others identify themselves as environmental or ecological economists. Since IWRM is a governance model, it is important to construct a theory on water and sanitation governance. Related to this framework is the fact that stakeholders embark on various forms of collective action to influence institutional arrangements from the IWRM platform.

Through collective action, stakeholders use various principles of water and sanitation governance such as equity and transparency to achieve goals that are difficult for individuals to realise. IWRM relies on the establishment of institutions and crafting institutional mechanisms which govern the roles, responsibilities, and powers of various stakeholders. Commercialised and privatised management models analyse “property rights” which govern ownership and the transfer of the latter from one title holder to another. Regardless of whether an institutional arrangement is biased towards public or private provision, “property rights” should be agreed upon at the watershed level. The implementation of IWRM reflects contradictions between decentralisation and centralisation of water governance which are associated with the role of market mechanisms, theories of production, consumption, and distribution.

Provision of water and sanitation services to households have transactional, information, and institutional transaction costs borne by service providers if they are state institutions and sometimes by households themselves if the providers are private firms of

commercialised state institutions. Linked to the various costs incurred, is also the fact that IWRM is premised on institutional evolution since new institutions are created and others undergo reforms. The evolution of IWRM institutions is elaborated on in this study, based on the theory of institutions which is a development on price mechanisms that dominated the WATSAN sector for some time. Countries implementing IWRM are faced with choices of recognising water and sanitation as a human right enshrined in constitutions, or recognising them as basic needs which are purchased as commodities. Implementing IWRM also entails promulgating laws and elaborating on the economics of contracts. In some countries, billing is a form of a contract between the state and its citizens. Households unable to pay their water bills are disconnected from services because in the eyes of the government or service providers, they are in breach of contract.

The body of knowledge referred to as environmental and ecological economics covers ecological efficiency and sustainability, physical and economic scarcity, and externalities. Proponents of IWRM are of the view that promotion of water as an integral part of the vital ecosystem can be achieved through water demand management and the prevention of wasteful practices. The assumption is that if IWRM is fully implemented, water resources will be sustainable for human livelihood, industries, agriculture, energy, and the ecosystem. The sustainability of water resources is affected by pollution and diseconomies which ecological economists refer to as “externalities”. In most instances when hydrologists talk about scarcity, they are referring to water as a physical resource and often ignore economic and institutional scarcity. In this chapter, the theories of water and sanitation governance, NIE, and environmental and ecological economics together show how IWRM results in shifts in institutional frameworks, governance, environmental management, and pollution abatement.

3.2 Water governance and collective action

3.2.1 Definitions of water and sanitation governance

There is general consensus on the definition of water and sanitation governance which refers to the range of political, social, economic, and administrative systems that are in

place to develop and manage water and sanitation resources and the delivery of water and sanitation services at different levels of society (GWP, 2002, Franks, 2004:1, Rogers, 2002:2, Rogers and Hall, 2003, Hoekstra, 2006:9, Heller, 2007:2). Governance in its general sense refers to the processes and systems through which a society operates. It relates to the broad social system of governing which includes, but is not restricted to the narrower perspective of government as the main decision-making political entity. Governance refers to both formal and informal structures, procedures, and processes (Hoekstra, 2006:9). In implementing IWRM, various informal structures such as WUAs and WATSAN are established. In addition to informal institutions, formal and statutory institutions such as CWSA (Ghana), and Mpira Water Authority (Malawi), are also established within the complex institutional arrangements constituting various IWRM platforms.

Livingston (2005:22) draws a distinction between micro and meso level governance institutions. The micro (informal) level refers to the fundamental forces that generate pressure for institutional innovation, often deriving from individual human values and interests. The meso (formal level) refers to the structures and dynamics of the actual process of institutional change, and the factors that may facilitate or pose obstacles to innovation. Micro level rules are embedded in the cultural and social milieu of the community, whereas meso level rules are based on constitutions, laws, and procedures (Livingston, 2005:22, Klein, 1999:463, Nabli and Nugent, 1989:1334). The constitutions of Ghana, South Africa, and Malawi, water and sanitation laws, policies, and statutes help to explain water and sanitation rights, institutions such as CWSA responsible for rural water and sanitation delivery in Ghana, and how IWRM institutional frameworks contributes to promoting water and sanitation scarcity in Africa.

Castro (2007:98) contends that poor water and sanitation governance is neither technical nor natural, but social and political in nature. Water politics has resulted in a crisis of access by the poor and of the governance of water ecosystems (UNDP, 2008, Castro, 2007:98, Hoekstra, 2006:9, Miller, 2003:55, Klein, 1999:464). Defining water and sanitation governance depends on the political, social, intellectual, and economic

assumptions that one adopts. For some, water and sanitation services are economic goods with private ownership property rights, while for others water and sanitation are social services whose “ownership” is ideally based on collective ownership (mainly state) and operation, defended by collective joint action (Rogers, 2002:6, Klein, 1999:458, Heller, 2007:2, Nabli and Nugent, 1989:1338, Bardham, 1999:4). The IWRM principle which states that water is an economic good is criticised as the main reason for water and sanitation scarcity: a manufactured scarcity targeting the rural poor because of their inability to pay for commercialised services.

For water engineers and other professionals in contrast, governance is an instrument; a means to achieve certain ends, an administrative and technical toolkit that can be used in different contexts to reach particular objectives. For others, grounded in social mobilisation, governance is a process which does not involve the implementation of decisions taken by experts and power holders, but rather a debate of alternative, often rival projects in societal development, and a definition of the ends and means that must be pursued by society through a process of substantive democratic participation (Castro, 2007:98, Rogers, 2002:10, Williamson, 2000:185).

Williamson (2000:183) uses a simple contractual schema to illustrate institutional failures manifested in markets, bureaucracies, and redistribution which he terms remediableness. Remediableness is an outcome for which no feasible superior alternative can be described and implemented with net gains which are presumed to be efficient. Bardham (1999:11) refers to causes of institutional failure as socially suboptimal or dysfunctional institutions established on the basis of survival of the fittest and conforming to institutional forms for fear of punishment for challenging established institutional arrangements (Williamson, 1990). The market, and bureaucratic and redistribution failures result in hydro politics within the formal and informal structures of an institution. Rogers (2002:10) refers to the application of politics to water and sanitation problems as ‘hydro-politics’ which can occur inside and outside of institutions and structures governing water and sanitation services. Hydro-political conflicts of interest here are caused by clashes between techno-scientific and socio-political paradigms of water and sanitation governance.

In a “Veblenian dichotomy” (originated from the work of Thorstein Veblen, in *Theory of the Leisure Class*, 1904 and *Theory of the Business Enterprise*, 1904) cited by Hamilton (1998), technology tends to erode institutional thought. Veblen (2003) highlighted a contradiction between upper and privileged classes and lower and sub-classes in terms of the occupations they hold and the impacts of access to water and sanitation service on their lives. The upper classes often enjoy unlimited access to water and sanitation services while the “barbaric lower classes” are often limited by their poor social standing in society. This dialectical relationship amongst classes results in confrontation and violence amongst the “Upper Leisure Classes and “Barbarian Lower Classes (Veblen, 2001). In the sub-classes, there are also housewives whose earnings are lower than the lower classes and an analysis of the antagonism amongst various classes often exclude housewives who are not part of the lowest pre-industrial strata of the society (Veblen, 2001). In this dichotomy there is a need to balance all the motive forces. An attempt to balance socio-cultural institutional aspects and technology forms part of Veblenian institutional analysis (Nabli and Nugent, 1989:1336, Miller, 2003:55). In bridging this pertinent gap, there is a need for establishing a balance between the techno-scientific, socio-economic, political, and cultural aspects of water management activities in decentralisation and for viewing water and sanitation as either an economic or social good (Castro, 2007:99).

The dominance of water resource management, water supply and sanitation by technocrats plus a Veblenian dichotomy often result in hydro-politics. I also argue that the clash between techno-scientific and socio-political paradigms as reflected in the affordability constraint and drive towards excessive decentralisation, is the root cause of water and sanitation scarcity for the rural poor. In particular, proponents of IWRM insist that the poor are willing and capable of paying more for water and sanitation services if the services are sustainable, against evidence to the contrary that is clearly witnessed through the socio-political paradigm. Because of the difficulties communities face in getting access to water and sanitation services within various IWRM frameworks, they often resort to collective action by establishing institutions to defend the right to water for the commons, and to challenge neoliberal structures that perpetuates scarcity. The next

section provides examples of collective action by rural poor households and African civil society.

3.2.2 Collective action

Collective actions under investigation in this research include the establishment of the Coalition Against Water Privatisation (CAWP) in Ghana and in Malawi, and various institutions which switched from being serviced by a commercialised SRWB to the Mpira Water Authority in order to access “pro-poor tariffs”. These collective actions were explicitly taken by non-state actors against the implementation of the IWRM approach.

In bridging the gap between techno-scientific, socio-political, economic, and cultural aspects of water and sanitation governance, Rogers (2002:4) proposes the need for collective action. Instead of private property rights pursued in settings where water and sanitation are viewed as commodities that one could purchase with money, people act together and pursue cooperative actions that may be difficult for an individual to achieve acting alone (Bromley, 1978:46, Nabli and Nugent, 1989:1338). To illustrate, when eThekweni (Durban) Municipality in South Africa introduced UD toilets to rural households the community of Wood Glen in the Outer West of Durban near Hammarsdale mobilised and demolished the UD toilet structures. This action forced the municipality to replace inferior facilities with dignified flush toilets. If an individual demolished his or her toilet, it could have been regarded as vandalism and harshly dealt with by the police, but to prosecute over 1000 protesting households was impossible.

Rogers’s (2002:4) analysis that collective or cooperative action arises because many results valued by human beings cannot be achieved by individuals acting alone, is relevant in this case. Collective action can emanate from interest group politics; individuals with a stake in water-use and allocation can meet their individual objectives within an existing structure of rights and laws and also seek to change the rules governing allocation of water and sanitation services in a manner that promotes their group interests. They can organise themselves to change the political system, specifically formal institutions and informal institutions. In Malawi, urban residents are served by SRWB, and rural areas by Mpira Water Authority, but Balaka District Hospital used collective

action in its primary health care facilities to stop the services of SRWB (the grievance expressed was low water pressure), and to opt for Mpira Water Authority which provided a more efficient and effective service. The district hospital thus managed to change the institutional rules of the game (Livingston, 2005:23, Miller, 2003:53, Richter, 2003:6, Rogers, 2002:4).

Collective action assumes that when people act together, their collectivity achieves the outcomes that are sought, and the benefits of that success are shared among participants in such a way that they renew their contributions and the collective action can continue. Successful patterns of collective action, like individual actions, become learned behaviour on the part of the participants, and crystallise into habits, cultures, and institutions, often becoming easier and more efficient to enact over time (Rogers, 2004:4, Miller, 2003:53, Nabli and Nugent, 1989:1338). Patterns of collective action can have a wide range of purposes and forms, and the possibilities of relationships and interactions among such patterns are numerous and fluid. They include nested relationships in which one social institution or pattern such as common acceptance among a population of some form of property right, forms a necessary enabling environment for another collective action such as a pooling of effort or resources to achieve a desired future outcome. Awareness of the positive cumulative results of successful collective action gives credibility to and makes possible further social enterprise and arrangements. Such awareness of the benefits of social cooperation can become a form of social capital which can be expressed in functional trust within an enterprise (willingness to accept authority), and can also be fungible and used outside a particular social enterprise (Richter, 2003:17).

Livingston (2005:24) illustrates transaction costs with the example of farmers organising themselves to change the rules of the game. A group of 200 farmers each has a R100 interest in changing rules, contributes R125 in legal and travelling costs, and competes with five industrial users who each have an interest of R1000 in keeping the rules as they are. The transactional cost of organising the industrial users is R150 per firm. The gain to farmers will be about R20 000 whereas the loss will be about R5000. Depending on the

costs and benefits, the farmers may, if they are unable to pay the transaction costs, decide not to pursue any action which would result in the industries gaining the upper hand. The gains may exceed the losses, but the information costs, transaction and other costs could not be met by farmers (Livingston, 2005:24, Bromley, 1978:45, Williamson, 2000:147).

A good example to illustrate the above theory is the extent to which commercial agriculture in South Africa, undermine the Department of Water and Sanitation in terms of renewing their licenses. They base their arguments on the fact that the Department has so far failed to install meters in farms and therefore they abstract water for commercial purposes without any payment. Instead of paying the Department, they collect funds through Irrigation Boards and WUAs and make it difficult for the regulator to perform its duties. They embark on collective action to frustrate DWS (Notes taken at the DWS water resources management strategy implementation for the Agricultural sector, on 20 September 2014).

The fact that social capital achieved in one forum is often carried into another forum or enterprise is an important characteristic of the very permeable boundary between an enterprise and its environment, and is necessary to understand the political aspect of water governance (Rogers, 2002:5). In reality, participants in a collective action, including governments, are supposed to have the same status as ordinary human beings in terms of being potentially self-seeking and opportunistic (trying to capture collective goods for private ends), but practically there is a tendency for power play which affect vulnerable groups. In that regard agreed and enforced constraints are required (electoral, legal, cultural or other) to ensure that a government or other collective action is not used for exploitative individual or private purposes (Rogers, 2002:5, Bromley, 1978:51).

The theory of collective action is premised on public or collective action that brings about joint benefits to society and also gives a voice, joint use, and public and common property rights to all regardless of wealth, power, and social status (Nabli and Nugent, 1989:1339). New institutional economists advocate for special institutional arrangements. A governmental organisation, in shaping information and transaction costs, rules of the

game, complete contracts, and collective action that maximise benefits to commons (Nabli and Nugent, 1989:1340, Williamson, 1989:139, Bardhan, 1999:14).

3.2.3 Principles of water and sanitation governance

I argue that institutions created as a result of the implementation of IWRM in South Africa, Ghana, and Malawi have neither been open, transparent, participative, accountable, effective, coherent, efficient, communicative, equitable, integrative, sustainable, nor ethical. It is worth noting that the principles of water governance, explained below, are accepted as important in the implementation of IWRM. None of the participants ever got their water bills on time from SRWB as indicated in chapters 6 and 8. This thesis, therefore argues that ignoring the core principles of water and sanitation governance was a recipe for rendering the implementation of IWRM in Ghana, Malawi, and South Africa unworkable.

Water and sanitation governance should be open. Institutions are expected to work in an open manner. Together with government agencies and private companies, they are expected to actively communicate about what the institutions and the government do and what decisions they take. They are further anticipated to use language that is accessible and understandable to the general public. This is of particular importance to improve confidence in complex institutions (Richter, 2005:1, Batterbury and Fernando, 2006:1853, Heller, 2007:3, UNESCO, 2006). It is a call for state institutions to be transparent in their dealings so that both insiders and outsiders can easily follow the steps taken in policy formulation. This is particularly important with regard to financial management which is expected to discourage suspicious or illegal transactions (Batterbury and Fernando, 2006:1853, Heller, 2007:3, UNESCO, 2006).

One of the principles of IWRM, is to place more emphasis on participatory approaches. The quality, relevance, and effectiveness of government policies depend on ensuring wide participation throughout the policy chain from conception to implementation. Improved participation is likely to create more confidence in the end result and in the institutions which deliver the policies. Participation, crucially depends on all levels of

government following an inclusive approach when developing and implementing policies (Batterbury and Fernando, 2006:1853, Heller, 2007:3, UNESCO, 2006). If water and sanitation processes are participatory there is a likelihood of improvement in accountability. Roles in the legislative and executive processes need to be clearer. Each of the institutions must explain and take responsibility for what it does. The rules of the game need to be clearly spelled out, as should the consequences for violation of the rules, and there should be built-in arbitration, enforcing mechanisms to ensure that satisfactory solutions can still be reached when seemingly irreconcilable conflicts arise among the stakeholders (Gandhi, Crase and Herath, 2007: 10, Gandhi, Crase and Herath, 2006:6, Batterbury and Fernando, 2006:1853, Heller, 2007:3, UNESCO, 2006). There is a strong link between accountability and effectiveness in water and sanitation institutions and policies.

Policies must be effective and timely, delivering what is needed on the basis of clear objectives, must evaluate future impacts and where possible, past experiences. Effectiveness depends on implementing policies in a proportionate manner and on taking decisions at the most appropriate level. Most importantly, the policies should be incentive-based. This will ensure that clear social and economic gains can be achieved by following the policy. Achieving effective water and sanitation governance demands a broad approach and coordination with other forms of governance (Hoekstra, 2006:9, Gandhi et, al., 2006:7, Batterbury and Fernando, 2006:1853, Heller, 2007:3, UNESCO, 2006, Spash, 1999:432). In addition to effectiveness, water and sanitation policies and actions should be coherent and easily understood. The need for coherence in governance is increasing: the range of tasks has grown and so has diversity, challenges such as climate and demographic changes cross the boundaries of sectoral policies on which government are built, and regional and local authorities are increasingly involved in water policies. Coherence requires political leadership and a strong responsibility on the part of institutions to ensure consistent approaches within complex systems (Gandhi et, al., 2007:6, Fiani, 2004:1019, Batterbury and Fernando, 2006:1853, Heller, 2007:3, UNESCO, 2006). IWRM plans are often referred to as efficiency plans, hence efficiency is important.

Classical economic theory demands efficiency in terms of economic efficiency, but political, social, and environmental efficiency also need to be balanced against simple economic efficiency. For example, minimising transaction costs will go a long way towards political efficiency (Klein, 1999:470, Weber, 2001:54). Neo-classical economic theorists argue that water use efficiency could be improved by charging prices based on full marginal cost; stimulating water-saving techniques in farms such as water recycling, drip irrigation, and the use of drought-resistant crop varieties; promoting the use of water-saving appliances in industries and households; and creating awareness among water users of the possible detrimental impacts of water use (Rogers et al., 2002, FAO, 2003, Deng et al., 2006, Wilson, 2004 and Hoekstra, 2006:15, Gandhi, et., al., 2007:5, Williamson, 2000:184, Livingston, 2005:25, Miller, 2003:53, North, 1993:4, Heller, 2007:3, UNESCO, 2006, Spash, 1999:432, Weber, 2001:54). One of the weaknesses of IWRM is lack of communication between the different platforms.

Government institutions and systems need to communicate with actors and stakeholders in very direct ways. Correctly done, this can lead civil society to be socialised into governance over a wide range of issues. Governance in the water and sanitation sector can be used as an education model for all other sectors and vice versa (Klein, 1999:470, Heller, 2007:3, UNESCO, 2006). In addition to a lack of communication, rural households also complain about a lack of equity when they compare themselves with their urban counterparts regarding the provision of facilities. Equity among the various interest groups, stakeholders, and consumer-voters needs to be carefully monitored throughout the process of policy development and implementation. It is essential that the penalties for malfeasance be and are seen to be equitably applied. More than a billion people do not have access to drinking water while others water their gardens, wash their cars, fill their swimming pools, and enjoy the availability of water for many other luxury purposes (UNESCO, 2003, Hoekstra, 2006:18, Gandhi and Namboordini, 2009:15, Livingston, 2005:26, Klein, 1999:474, Heller, 2007:3, UNESCO, 2006, Spash, 1999:423). IWRM implementation calls for integration, sustainability, and ethical conduct amongst stakeholders.

Water and sanitation governance should enhance the effectiveness of IWRM. Institutions will have to consider all uses and users in the traditional water sector as well as their interconnections with and impacts on all other potential users and sectors (Pearce, 2002: 62). Water and sanitation governance must serve future as well as present users of water and sanitation services (Hoekstra, 2006:18, Heller, 2007:3, UNESCO, 2006, Spash, 1999:432, Pearce, 2002:61). Water and sanitation governance has to be based on the ethical principles of the society in which it functions. This is strongly manifested in the property rights for use, access, and ownership of water (Rogers, 2002:2-4, Fiani, 2004:1003, Heller, 2007:3, UNESCO, 2006, Spash, 1999:432).

3.2.4 Institutional mechanisms

The implementation of IWRM has brought about reforms and the establishment of new institutions that never existed before. Some of the institutions have been given responsibilities they were not ready for, including district and local assemblies that were expected to support the Environmental Protection Agency (EPA) of Ghana in regulating pollution. Even contributing 5% of the installation, operation and maintenance costs was a responsibility that the district assemblies were not ready to perform. The institutional mechanisms brought about as a result of the implementation of IWRM in fact did not work. North (1993:5) distinguishes between institutions and organisations. Institutions represent the rules of the game of a society, or more formally, are the humanly-devised constraints that structure human interaction. They are composed of formal rules (statute law, common law, regulations), informal constraints (conventions, norms of behaviour, and self-imposed codes of conduct), and the enforcement characteristics of both. Organisations are the players: groups of individuals bound by a common purpose to achieve objectives. They include political, economic, social, and educational bodies (Soderbaum, 1990:483, North, 1993:6, Richter, 2003:10, Nabli and Nugent, 1989:1335).

The introduction of IWRM in Ghana, Malawi, and South Africa required the establishment of decentralised institutions such as CWSA, Ghana Water Company, the Mpira Water Authority, and SRWB. The functions originally performed by national line

ministries were devolved to local institutions which were without the capacity and resources to provide water and sanitation services to rural households. Institutions as already mentioned, are made up of formal rules, informal norms and the enforcement characteristics of both, and it is the admixture of these rules, norms, and enforcement characteristics that determines economic performance. While formal rules can be changed overnight, informal norms change gradually. Politics shape economic performance because they define and enforce the economic rules of the game (Soderbaum, 1990:483, North, 1993:7, Nabli and Nugent, 1989:1335). North and other institutional economists acknowledge that research in new institutional economics and politics has so far focused on USA and other developed countries although there is increasing work being done in Africa (North, 1993:7, Miller, 2003:52). I argue that the institutions created in Africa are based on European and American models and have resulted in water and sanitation poverty being perpetuated instead of addressed by decentralisation.

Institutional problems in the water and sanitation sector in Africa represent a very serious challenge for sustainable development. Standard neo-classical theory has little to offer in terms of practical and durable contexts. Neither revisionists nor market friendly theories offer any sustainable solutions. The IWRM governance model which is based on neo-classical, revisionist, and market-friendly theories is flawed when it comes to institutional mechanisms through which water and sanitation projects are governed (Pearce, 2002:63).

The implementation of IWRM in Ghana, Malawi, and South Africa has relied on market forces and the commodification of water and sanitation services. According to Williamson (1995:189) the neo-classical view is based on the fact that growth is best ensured by allocating resources through markets in where there is macro economic stability and limited inflation. The revisionist view sees market failures as pervasive and a justification for governments to lead markets in critical ways. The market-friendly view is premised on the fact that the appropriate role of government is to ensure adequate investment in people, provision of a competitive climate for enterprise, openness to international trade, and stable macroeconomic management. New institutional economists recognise the role of institutional mechanisms such as culture, politics, and history when

dealing with models of water and sanitation governance (Williamson, 2000:189, Saleth and Dinar, 2004, Richter, 2005:1). Private property rights and the formal enforcement of contracts and sub-contracts are key elements in market-friendly institutional mechanisms. New institutional economists favour bottom-up institutional mechanisms just like environmental economists (Saleth and Dinar, 2004).

The analysts of IWRM implementation in Africa as reviewed in chapter 4 present arguments about the importance of prices and institutions in rural areas. The views of institutionalists are contradicted by those of price determinists such as the AfDB in Africa. Neo-classical economic theories place more emphasis on getting the prices right and therefore establishing a coherent price mechanism, whereas new institutional economists place more emphasis on getting institutions and institutional mechanism right (North, 1993:5, Richter, 2005:1). This is a fundamental shift from neoclassical, revisionist and market-friendly theories; a move from macro-analytic to micro-analytic approaches to economic development towards the current era of new institutional economics (Williamson, 1995:172). Determining the right price for water hardly solves the problem since the major problem lies in invoking the price and cost recovery supported by the Africa Water Facility, SRWB, Ghana Water Company, and CWSA (Gandhi, et. al., 2007:5). Price and other market mechanisms are not a panacea for ills in the water and sanitation governance in Africa. Evolving institutional arrangements and mechanisms are fundamental to solving the water and sanitation governance challenges facing Africa (Gandhi, et. al, 2006:10).

Governance structures are described by Klein (1999:468) as a polarisation between markets and hierarchies. At one end of the spectrum lies the pure anonymous spot market which suffices for simple transactions such as basic commodity sales. At the other end lies the fully integrated firm where trading parties fall under unified ownership and control. In such a hierarchy there is greater protection for specific investments and provision for relatively efficient mechanisms able to respond to change when coordinated adaptation is necessary. Compared to decentralised structures, hierarchies provide managers with weak incentives to maximise profits, and normally incur additional

bureaucratic costs (Williamson, 1985:79, Klein, 1999:468, Richter, 2003:15). The chosen governance structure depends on the existing institutional environment (Richter, 2003:15). I further argue that it is the creation of an enabling environment for private sector participation, community management in rural areas, and decentralisation imposed by donors that rendered the implementation of IWRM in Africa unworkable.

3.2.5 Property rights

The fact that the implementation of IWRM promotes private property rights at the expense of public property rights, is the reason why this thesis argues that private property rights are responsible for the failure of IWRM implementation in Africa. The customary and common water rights which the people of Ghana enjoyed prior to the implementation of IWRM were abolished and replaced by private property rights which promoted water and sanitation scarcity. Property rights can be understood as social relations that define a person's titlehold with regard to something of value as distinct from all others. Rights can only exist when there is a social mechanism that prescribes duties and binds individuals to those duties. Rights only have an effect where there is a system of authority that agrees to defend a rightholder's interest in a particular outcome (Kuks, 2004:51, Fiani, 2004:1009, Bardhan, 1999:2).

A property rights system can be regarded as a system with claims and duties which means that allowing one actor a specific behaviour implies a restriction on the behaviour of another. Property rights virtually always guarantee owners the opportunity to use their properties in a variety of ways while safeguarding them against the unauthorised use by others. Property rights are a combination of ownership titles and user rights (Quiggin, 2000:17). Ronald Coase and Douglas North (1992) developed institutional mechanism theory into fully fledged private and public property right theories. While the emphasis in the neo-classical era was on putting prices right, the emphasis has shifted into getting institutions right, together with associated property rights. Property rights according to North (1993) are defined in a political context, and politics and laws, together with the

rules of the game, shape economic performance because they define and enforce economic rules. The idea of getting institutions right can be viewed as an exercise in exercising institutional mechanisms and rules that can only be enforced through either private or public property rights (Quiggin, 2000:17).

Private property rights are exclusive in the sense that ownership title and use rights reside in the hands of one individual to the exclusion of any other individual. According to Hamilton (cited in Miller, 2003:55) rituals of ownership, private property, central banking, and the other accoutrements of a market economy are viewed by orthodox economics as a means of progress when in fact they are at best permissive and often inhibitory. Proponents of private property rights (Coase, 1960, Scott, 1955, Demsetz, 1967, Furubotn and Pejovich, 1974) claim that private ownership yields socially optimal outcomes compared to common property rights (Quiggin, 2000:17, Bromley, 1978:46, Bardhan, 1999:22).

In the case of public property rights we have to distinguish between state property, common property, and no property (Quiggin, 2000:19, Pearce, 2002:59). Common property occurs where rights reside jointly in a group of actors who own undivided shares of the property. Under common property arrangements each owner possesses the right to use the property and they jointly possess the right to exclude others from it. Although common property is often confused with open access where exploitation is more likely, the risks in common property resources are serious as they depends very much on the type of common property regime that is active, and may differ from situation to situation (van den Bergh, 2007:530, Quiggin, 2000:19, Pearce, 2002:59). State property means that the state or a public authority has property rights. Contrary to private property rights, the state has to use these rights in the public interest (Kuks, 2004:52).

Water is often said to be a fugitive and rife with externalities. Its governance is non-rival, entails substantial transaction costs, and suffers from information deficiencies. Crafting institutions for water and sanitation governance is challenging and requires skills regarding how rules, property rights associated with physical, economic, and cultural

environments, and appropriate institutions can promote maximum benefits for beneficiaries (Ghandhi, et., al, 2007:6, Quiggin, 2000:19, Bromley, 1978:53).

Norms play an important role in constraining the choice of property rights (North, 1993:14, Fiani, 2004:1009). Norms also influence the evolution of institutions, institutional frameworks, and institutional environments (Fiani, 2004:1009). In Africa it is argued that IWRM stakeholders such as commercial agriculture enterprises do not experience water and sanitation scarcity because of private property rights which enable them to extract water without licenses. Commercial farmers account for more than 35% of the water consumption in most countries and they are immune from water rationing and restrictions imposed by local authorities and water boards because they are not connected to the latter's piping systems but extract water directly from rivers and aquifers without licenses. The mining sector is equally guilty of manipulating private property rights and some operate without water-licenses. This thesis argues that the private property right dispensation within IWRM platforms have promoted water and sanitation scarcity in Africa.

3.2.6 Public and private provision

In this section, I am concerned with the ownership of water resources by either private companies or state institutions. In Malawi water resources, apart from commercial farming, mining, and industries are in public hands, but the commercialised water boards that serve most urban households use the IWRM principle that water is an economic good, as an excuse to restrict the poor from gaining access. In Ghana the urban water sector is privatised and rural communities are expected to manage, operate, and maintain their own water resources. This thesis argues that privatisation, commercialisation, decentralisation, and community management are elements of IWRM implementation jointly responsible for water and sanitation scarcity in Africa. The situation is aggravated by a dichotomy between public and private management as outlined by Williamson and North below.

Williamson's transaction cost economics (TCE) differs from North's theories regarding the objects of research: private goods in case of the TCE and public goods in the case of North's theory (Richter, 2003:10). The role of government in shaping the institutional environments of businesses and commons as well as the administrative capacities of government, have been neglected by neoclassical economists. NIE puts more emphasis on balancing the roles of private as well as public provision (Richter, 2003:10). Both state and firms are similar in nature; both are devices to save on transaction costs. For both size and organisational form or governance structure matter. The size and governance structure depends upon initial conditions and whether they are path-dependent, upon transaction costs, upon the state of organisational and technical knowledge, and upon transaction-specific investments. A basic social structure or rules of the game should be given at the outset (Richter, 2003:16). The failure to balance public provision with private sector involvement is responsible for water and sanitation scarcity in Africa.

3.2.7 Decentralisation and centralisation

One of the principles of IWRM is that management needs to be applied at the lowest appropriate level. In line with this implementation advice Ghana, Malawi, and South Africa have promulgated decentralisation laws and delegated responsibilities to district, metro councils, and local assemblies. In chapters 5, 6 and 7, it is argued that Ghana and Malawi were not ready to decentralise, and thus re-centralisation of certain services became inevitable. Decentralisation according to Osmani (2001) happens across four key areas:

- Bodies separated by law from the national centre, in which local representatives are given formal powers to decide on a range of public matters.
- A political base in the locality, not the nation.
- A limited area of authority entrenched with the right to make decisions on areas within their jurisdiction.
- Local authorities which command resources that may be spent and invested at their own discretion (Mawhood, 1983, *The Sustainable Livelihoods in Southern Africa* (SLSA), 2008:2).

Related to the above definition of decentralisation, the manner in which decentralisation is implemented in various countries tends to differ. One approach is to focus on democratic decentralisation through the creation of elected local government structures (SLSA, 2008:2). However, there are many different perspectives on decentralisation which range from political decentralisation, deconcentration or administrative decentralisation, delegation, devolution, fiscal decentralisation, privatisation, and participatory local governance. There are equally proponents as well as opponents and critics for all these diverse forms of decentralisation (Wunch, 2001, SLSA, 2008:2, Heller, 2008).

Proponents of decentralisation (Indranil, 2009, Batterbury and Fernando, 2006:1851, Selee and Tulchin, 2004:297, Wunsch, 2001) argue that decentralisation is expected to take care of the needs and preferences of communities by devolving powers to lower levels. It is also expected to increase the accountability of governments in service delivery. The latter is expected to be better through decentralised than through centralised institutions because local governments operate more closely with the people than other levels of government (Indranil, 2009, Batterbury and Fernando, 2006:1851, Selee and Tulchin, 2004:297, SLSA, 2008:3).

Decentralisation promotes efficiency, enhancement of public services, and more open and accountable forms of government (Batterbury and Fernando, 2006:1851, Selee and Tulchin, 2004:297, SLSA, 2008:3). This analysis of decentralisation is based on the concepts of good governance i.e. openness, participation, accountability, effectiveness, coherence, and civic peace. Other concepts include neo-liberal reforms, non-state institutionalisation, planned development, environmental governance, and rules of the game (Batterbury and Fernando, 2006:1856 Selee and Tulchin, 2004:297, SLSA, 2008:3). According to Selee and Tulchin (2004:297) decentralisation processes often produce mixed results for democratic governance as well as for equity. Under decentralisation reforms, new opportunities for corruption are opened up, and environmental sustainability is hard to achieve. Decentralisation creates new institutions

and therefore new political actors who benefit from the new political order (Batterbury and Fernando, 2006:1852, SLSA, 2008:3).

There is often a significant gap between the rhetoric of decentralisation and the actual policies which are implemented. The kinds of institutional arrangements employed often limit the capacity and autonomy of local governments or provinces to implement the functions they are supposed to perform which in turn undermine their relevance in the democratic process. Institutional arrangements sometimes exacerbate existing inequalities and strengthen some spheres of government at the expense of others. Actors at the centre also persist in trying to retain authority and control of resources. There are loopholes in decentralisation legislation to the extent that central ministries ignore local authorities, local authorities are unable to discharge their responsibilities, and local government staff are poorly paid and trained. All these problems may lead to a system collapse. When local government systems collapse, central or provincial government re-centralises, or takes over in a care-taker capacity (Selee and Tulchin, 2004:297, Wunsch, 2001:277, SLSA, 2008:2, SLSA, 2008:4).

To overcome this, more effective vertical structures of political and administrative accountability and control including legal constraints, are required to supplement the existing horizontal arrangements. The decentralisation approach is deficient in practice and international development thinking is out of touch with local realities on the ground. Decentralisation is further complicated by privatisation of water and sanitation services in the form of public utilities and local government structures. Such moves result in massive increases in user-fees and have negative impacts on the livelihoods of the poor communities. Decentralisation is rooted in neo-liberal thinking with regard to the efficiency of service delivery through market-oriented and western liberal conceptions of good governance, and with regard to the antecedents in colonial policies of indirect rule and assimilation (Selee and Tulchin, 2004:297, SLSA, 2008:4).

This process has happened in response to government reforms, a change in government or aid conditionalities, or because of a major decision to implement new models of

resource management or service delivery. Decentralisation processes also suffer from a lack of environmental economics such as eco-govern-mentality in its implementation. Eco-govern-mentality refers to the formation and stewardship of formal and informal rules that regulate the public realm, and the arena in which the state as well as economic and societal actors interact to make ecologically sound decisions (Batterbury and Fernando, 2006:1853, SLSA, 2008:1).

Decentralisation should promote respect for indigenous identities, structures, values, institutions, and heritage (Deng, 1998:151, SLSA, 2008:1). To do so, political and judicial measures and instruments are required. Decentralisation alters the social and economic landscape by changing both the form and scale of decision-making processes and the financial and human resources available (Batterbury and Fernando, 2006:1854). Decentralisation processes have led to significant changes in the ways that central ministries, local government, and regional authorities are managed and structured. While in some cases local elected bodies have received real decision-making and revenue raising powers, other governments have merely de-concentrated their activities by transferring central powers to state appointees at the local level. Decentralisation increases the roles and participation of non-state actors in development (Batterbury and Fernando, 2006:1856, Wunsch, 2001:277).

Decentralisation could help governments to create enabling institutional environments and arrangements that can promote local leadership accountability. Friedman and Kihato (2004) use integrated development plans in South Africa as examples of institutional arrangements created through decentralisation. Another important contribution of decentralisation is that it promotes environmental economics governance which links environmental quality or scarcity and social and political well-being with growing economic and ecological disparities. A series of environmental conditionalities now accompany major infrastructure projects, further disciplining recipient countries and local populations into accepting new laws, property rights, and environmental commitments (Goldman, 2004, SLSA, 2008:1). The outcome of these conditions is degradation of

water and sanitation resources, pollution, and negative health impacts to local communities (Bond, 2010:446, SLSA, 2008:7).

Centralisation on the other hand is by no means an unattractive goal. It has allowed states to avoid fragmentation and promote development, with greater possibilities of cross-subsidisation from wealthier to poorer areas and peoples. State-led development has produced important achievements in growth for most developing countries and has helped to spawn national industrial capacity. The results of these achievements have often been poorly distributed and often primarily concentrated in capital and a few major cities. Centralisation has helped to eliminate regional competition, prevented ethnic fragmentation, and achieved a measure of development. On the other hand, depending upon the cases, centralisation has sustained undemocratic and exclusive authoritarian governments, intimidated opposition parties and organisations of civil society, amplified regional inequalities based on differential patronage, and perpetuated rural poverty (Selee and Tulchin, 2004:299).

Decentralisation is motivated by the growth of citizen demand for government openness and accountability, but also represents conditionalities from international financial institutions and donors. It transfers a slice of power to local elites, enhances their legitimacy, and is part of constitutional reforms. Sometimes decentralisation represents an emergency measure to keep a country together, creating a space for marginalised local groups in government structures, resourcing administrative centres, reducing central state expenditure, and achieving more efficient service delivery (Selee and Tulchin, 2004:297, SLSA, 2008:7).

Decentralisation has impacts on institutional arrangements. It determines the legal status of sub-national governments, their degree of autonomy, their capacity to assume particular responsibilities, channels of accountability, and resources. Decentralisation processes have political, administrative, and fiscal dimensions. It entails the redistribution of authority between national and sub-national units and between sub-national governments and citizens. Through decentralisation-specific functions levels of

government are assigned, collection of revenue in the form of taxes and service-fees is determined, and budgeting takes place in various levels of government (Selee and Tulchin, 2004:301, SLSA, 2008:8). The power, autonomy, status, roles, functions, responsibilities, capacity, and authority of various levels of government need to be clearly outlined in a constitution, and be supported by legislation, resources, and enabling environments for policy formulation and implementation (Selee and Tulchin, 2004:309). The quality of water supply and sanitation services is better in areas where the responsibility of operation and maintenance is devolved to local governments (Indranil, 2009).

Critics of decentralisation (Wunsch, 2001:278) argue that it promotes recentralisation in planning and capital investment, in budgeting and fiscal management, in personnel systems and management, and in finance and revenue. Decentralisation often consumes local government resources, erodes their credibility, and demonstrates their lack of authority; in the process perpetuating grassroots disempowerment. As much as local planning is encouraged, there is a tendency by central government to implement top-down prioritisation based on political and economic interests and an inability to sustain local problem identification, local priority setting, budget capacity, and information gathering (SLSA, 2008:8). In local government there is a lack of sufficient technical human resources to perform technical budgeting functions, confusing roles of locally elected representatives and their national counterparts, and recapturing of authority and resources allocated to local government. An example of the recapturing of authority and resources allocated to local government in South Africa is the fact that the Department of Water and Sanitation (DWS) continues to issue water licenses in all parts of the country. Provincial branches and local authorities are in theory decentralized units or branches of DWS, but in practice they are not supposed to issue water licences. A water user needs to travel to Pretoria to apply and renew a water license. The laws of the country promote decentralization, but powers and functions of local levels of government are performed by the central state. Locally-elected officials are sometimes unable to supervise local administrations, and there is also national control over local choices and resources. There are also delays in disbursing funds to local authorities which results in a further re-

authorisation process, unfunded mandates, and inequalities among regions (Wunsch, 2001:280, SLSA, 2008:8).

In local government, lack of staff retention, lack of a single employer, and lack of equal salaries and benefits promote high staff turnover thereby hampering governance. In Ghana, technical personnel remain employees of a central ministry but are supposed to be responsible and accountable to locally-elected government officials. This situation tends to ignore local government policies and priorities (Ayee, 1997; Achempong, 1995, SLSA, 2008:8).

There is also lack of clarity about scale, the stability of national grants and financial transfers, and the extent to which a local authority can raise its own revenues. National grants are sometimes the only source of funding for local government but are often insufficient to meet local expenditures. Other contested issues are criteria for determining the size of allocations to local authorities, conditions of grants such as local added revenue, local cost recovery for services, and financial management and accountability (Wunsch, 2001:285, SLSA, 2008:12). Decentralisation leads to the creation of parallel structures in the same local area, and such structures can block or divert development initiatives. Decentralisation also takes place in complex contested environments among social groups with wealth, age, gender, and ethnic cleavages. There is always competition for resources between local government and central government structures and also a lack of vibrant voices from the rural poor (SLSA, 2008:19). Lack of capacity, unfunded mandates, competition amongst institutions, and the fact that technical staff often report to national ministries and not local authorities, are some of the key constraints of decentralisation that have resulted in IWRM failures and led to water and sanitation scarcity in Ghana, Malawi, and South Africa.

3.2.8 The role of market mechanisms

The establishment of various institutions within an IWRM framework (for example CWSA responsible for rural water and the Ghana Water Company Limited responsible for urban water supply), are examples of how consumption, production and distribution

are considered in practice. Separation of water resource development from water reticulation, regulation, and sanitation in Ghana, Malawi, and South Africa also reflects the complicated implementations of IWRM. There are three important institutional theories that elaborate on the role of market mechanisms in institutional economics. They are (i) the institutional theory of consumption, (ii) the institutional theory of production and (iii) the institutional theory of distribution (Miller, 2003:56-61).

Traditional economic theories assign a minor role to consumption and its relation to scarcity and choice. Neo-classical theories place more emphasis on production and less on consumption. Institutional economists place more emphasis on consumption. Veblen's theory of the leisure class (Veblen, 2003) constitutes an alternative to the labour and utility theories of value and the price theory of valuation which are at the heart of orthodox theory. Key to the theory of consumption is the availability of commodities that have both a ceremonial and an instrumental function (Veblen, 2001). They constitute both status symbols and a means of furthering the life process and are not some pleasurable end of the production cycle (Hamilton, 1989: 1100-1).

Consumption is a predominant problem in industrial society, associated with conversion because our consumption or quasi-consumption is localised in metropolitan areas and effluents are concentrated to the point of swamping the assimilative and dispersive capacities of local environments. Water production takes place in rural areas where dams are located; consumption takes place in urban areas (Chapman, 1973:1415).

The second theory is the theory of production. Hamilton's view of production is that of a cooperative, the harvest of a body of historically accumulated knowledge and skill, a social act. Skills levels of the workforce determine the level of production and industrial arts as a communally developed joint stock. Unlike orthodox economists, institutional economists do not measure the individual contributions of single productive units. The factors of production are not viewed according to a neoclassical status system and based on an individualistic theory of production, but viewed as collective efforts (Hamilton, 1987: 246-250, Klein, 1999:463). Institutionalists find it important to distinguish between

the real value of property (tangible property) and its inflated value (intangible property). One of the attributes of ownership is that it grants the ability to inflate the value of property by vesting it with such qualities as goodwill, reputation, and anticipated future earnings. Ownership also makes it possible to increase scarcity value by withholding productive factors from production (Miller, 2003:58, Klein, 1999:463).

An increase in scarcity value serves only private interests and not the interests of society since public interest is to increase production and not promote scarcity. The other related contradiction is that of real assets and capitalised value, versus deregulation. Deregulation has been advocated in the belief that it is akin to, if not indistinguishable, from competition. It is undertaken in the belief that market forces can be relied upon to exercise appropriate control over pricing and other business activities, and that social control is unnecessary and harmful to the economy (Miller, 2003:58). Market forces however have not controlled but instead have been controlled by economic power.

Institutionalists take as their subject matter existent industrial conditions rather than some ideal market structure. They recognise that the simple removal of entry and exit barriers does not automatically produce competition in imperfect markets and that the dogma of free entry and exit central to the formal neo-classical model, does not settle the issue of industrial structures. Other issues that institutionalists do not consider are market size, redundancy and excess capacity, price-cutting, economies of scale, consolidation, increase of market share, and sales. Institutionalists instead see turmoil, widening conflicts between business and industry, camouflage debt, inflated sales and profits, bolstering of stock prices, manipulation of prices through fraudulent congestion payments, and conflicts of interests (Miller, 2003:59, Klein, 1999:463).

In the production of water and sanitation services, the challenge faced by developing countries are the various factors of production, i.e. labour, natural resources, capital, and entrepreneurship. The availability of suitably qualified employees in local authorities remains a challenge. Building waste water treatment plants require huge investments and

Ghana and Malawi depend on donors for their capital costs; the theory of production from an institutional point of view is therefore relevant.

The third and last theory is the theory of distribution. Orthodox economics justifies existing income distributions on both efficiency and equity grounds. It contends that factors are employed to the point that marginal revenue is produced, and that at that point, they are equal to the marginal cost of employment. This satisfies the efficiency criterion. The theory maintains that factors of production receive an income equal to their individual contributions to the total product which is the income they deserve, thus fulfilling the equity standard. Institutionalism challenges the marginal productivity basis of the neo-classical explanation of income distribution (Miller, 2003:60).

Institutionalists such as Hamilton (1987:250-251) use income to measure contribution. Income is based on the recipient's social status. Marginal productivity theory legitimises and authenticates the existing income distribution system, rather than explaining either production or distribution. Societies assign ceremonial roles that predetermine income levels to individuals based upon social ranking schemes. Higher rankings and incomes are assigned to tasks involving some degree of exploitation, lower rankings to tasks viewed as drudgery (Veblen, 2003). Social rankings and not marginal productivity are the basis of income differentials. Hamilton also rejects the neo-classical notion that poverty is an inescapable part of the human condition. He believes that this notion is based on the belief that poverty is a result of personal traits of the poor which limit their ability to participate in the economy, and in any event that attempts to remedy poverty will be ineffective and self-defeating because a redistribution of income will result in decreased capital formation and decreasing standards for all, including the poor (Hamilton, 1971:73).

Hamilton views poverty as the result of the social ranking system in effect. Cultural definitions of poverty vary based on the income necessary for full and meaningful participation in society. At incomes below this standard, one is considered poor. The minimum education, shelter, and consumption that this standard defines will vary both

between societies and within societies over time. He advocates that poverty be addressed through programmes of income maintenance and progressive taxation. Such an approach could help to deal with the distributional inequity and economic instability that is inherent to capitalist societies (Hamilton, 1984: 148-9).

The fact that in Ghana and Malawi there are no subsidies for indigent households, makes the theory of distribution relevant in explaining the failures of IWRM implementation. The fact that rural communities are subjected to community management and pay more than their urban counterparts sheds light on the social ranking systems in IWRM implementation which prohibit the rural poor from getting access to water and sanitation services.

3.3 New Institutional Economics

Miller (2003:53) presents a history of institutionalism, and points out that initial attempts at institutionalisation began to decline in the 1940s due to the impact of Keynesian economics (Nabli and Nugent, 1989:1333, Richter, 2005:2). New institutional economics (NIE) is an attempt to revive institutionalism within economic policy discourse. However, even when institutional economics was beginning to decline, David Hamilton kept institutionalism alive (Miller, 2003:53, Richter, 2003).

The recent revival of interest in institutions and their role in economic development has led to the emergence of new institutional economic thought. This school is led by the work of economists and economic historians such as Douglas North, Robert W. Fogel, Ronald Coase, and Oliver E Williamson amongst others (Klein, 1999:437, Richter, 2005:1). NIE is a generic term introduced by Oliver Williamson (1975:1, Nabli and Nugent, 1989:1333, Richter, 2005:1, Soderbaum, 1990:489, Richter, 2003:13, Richter, 2005:2).

It is now widely accepted that apart from inputs and technological change, institutions clearly are the major determinants of growth and development. The study of institutional forms, institutional arrangements, institutional design, institutional constraints, and how

institutions change, has assumed great importance (Richter, 2005:2). Commons (1934), North (1987), Adelman & Lohmoller (1994), Oslon and Kahkonen (2000), and Picciotto (1995) have contributed to the economic analyses of institutions. In the context of water and sanitation institutions, Bromley (1982), Ruttan & Hayami (1984), Ostrom (1990), Griffin (1991), Crase, Dollery and Lockwood (2002), Herath (2002), Dinar (2000), and Saleth and Dinar (2004) regard new institutional economics as a useful conceptual framework for analysing water and sanitation institutions (Ghandhi, et., al 2007:7, Klein, 1999:457).

NIE is an attempt to incorporate a theory of institutions into economics and in the process to abandon the bounded instrumental rationality of neo-classical economics, which is an institution-free theory. New institutional economists also move away from reductionist-mechanistic modes of thinking which is characteristic of neo-classical economics and embraces holistic evolutionary thinking. The neo-classical reductionist-mechanistic approach is built upon the belief that far-reaching specialisation and simplification is fruitful (Soderbaum, 1990:485, North, 1993:1, Klein, 1999:457, Richter, 2005:2). In contrast to many earlier attempts to overturn or replace neo-classical theory, NIE builds on, modifies and extends neo-classical theory to permit it to come to grips and deal with an entire range of issues heretofore beyond its ken.

What it retains and builds on is the fundamental assumption of scarcity and hence competition. What it abandons is instrumental rationality, i.e., the assumption of neoclassical economics that has made it an institution-free theory (North, 1995:17, Richter, 2003:8). NIE embraces the theory of embeddedness through which economic action takes place within the networks of social relations that make up the social structures and entitlements based on power relations (Bromley, 1978:45, Nabli and Nugent, 1989:1334). Institutions are social constructions, the products of visible hands. There is no invisible hand behind the creation of a market, but sharp interest struggles. Institutions need to be the result of purely rational choices, based on bounded rational actions (Richter, 2003:24, Granovetter, 1985:482).

3.3.1 Transaction costs and information costs

Implementing water and sanitation projects in Africa requires the consideration of both transaction and information costs. This entails, but is not limited to the costs of conducting environmental impact assessments at project conceptualisation stages, currency conversion from US dollars to Malawi Kwacha and Ghana Cedis for procurement of equipment and consumables, public participation processes, reviews of government policies, and negotiating contracts. Williamson (1985:2) defines transaction costs as the effort, time, and expense necessary to obtain the information necessary to make, negotiate, and enforce an exchange. These exchanges are essentially economic contracts. Transaction costs are also the ease or difficulty with which individual economic agents can operate within a given institutional structure (Livingston, 2005:31, Klein, 1999:464, 466, Fiani, 2004:1005, Richter, 2005:2). North (1992:7) defines transaction costs as the cost of measuring the valuable attributes of goods and services or the performance of agents in an exchange that is fundamental or key to the cost of transacting. This definition is related to the measurement and enforcement of property rights (Fiani, 2004:1005). Coase (1937) refers to transaction costs as all costs incurred when a transaction is performed through the market, with no direct reference to what is really being transacted. Williamson (1990) does not make any reference to property rights in his definition and analysis of transaction and information costs. According to him, transaction costs are central in environmental and ecological economic analysis. They include the information costs, contracting costs, and policing costs that the EPA of Ghana incurs in ensuring that waste water treatment plants are properly managed regardless of whether they are state property or privately owned (Fiani, 2004:1006, Bromley, 1978:47-53).

The manner in which North (1993:1) uses information costs is different from its use in neo-classical economics. In a world of instrumental rationality institutions are unnecessary and ideas and ideologies don't matter; efficient markets, both economic and political, characterise economies. In fact, we have incomplete information and limited mental capacity with which to process information. Human beings impose constraints on human institutions in order to structure exchange. In such a world ideas and ideologies

play a major role in choices and transaction costs which result in imperfect markets (Klein, 1999:466), North (1993:1, Richter, 2003:8), and has modified the instrumental rationality assumption. In implementing IWRM, WUAs and WATSAN committees find themselves lacking information on project evaluation documents and water and sanitation policies, yet they are expected to be equal partners and participants in various IWRM platforms.

There was a need to modify IWRM processes to give users a platform to discuss tariff reforms, and to negotiate conditions imposed by donors such as the contribution of user-fees, operation and maintenance fees, and installation fees. The modification placed more emphasis on the mental modes that individuals use to interpret the world around them, based on culturally derived knowledge passed on from generation to generation, and the values and norms that distinguish one community from another. Incomplete information and limited mental capacity with which to process information determines the cost of transacting which underlies the formation of institutions. The costs of transacting arise because information is costly and asymmetrically held by the parties in the exchange. Institutions are formed to reduce uncertainty in human exchange. The neo-classical assumption of efficient markets on which IWRM is premised, can thus be realised if it costs less to transact and, when it is costly, institutions matter (Nabli and Nugent, 1989:1335, North, 1993:2, Richter, 2003:10).

When there are significant transaction costs, such as the 5% which district assemblies and communities contribute prior to project executions in the rural areas of Ghana, the institutions are designed to induce actors to acquire essential information to lead them to correct models. Individuals often act on incomplete information and subjectively derived models that are frequently erroneous. Such errors are addressed by formal rules created to serve the interests of those with the bargaining power to create new rules (North, 1993:3, Richter, 2003:8). Instead of assuming that transaction costs are low or zero if the state subsidises households (which is not the case in Ghana and Malawi), it is pivotal to evaluate human factors and related property right entitlements and their interface with the natural environment (Bromley, 1978:45).

3.3.2 Institutional transaction costs

The implementation of IWRM has brought about decentralisation, institutional shifts, and the creation of new institutions such as WRC, EPA, WRB, water boards, WUAs, and WATSAN committees. There was a need to shift transaction approaches to be in line with water and sanitation reforms. The transaction approach was originally developed purely in an economic context by Coase (1937) and Williamson (1975), and subsequently amended by North (1990) to allow for the role of the real costs associated with many non-economic and non-market aspects (Saleth, 2004:8). The institutional transaction cost framework used did not include endogenous institutional features that are pertinent to water and sanitation governance (North, 1990, Ostrom, 1990, Saleth and Dinar, 2004).

Livingston (2005:31) expands the definition of transaction costs to include institutions. The definition includes the costs of modifying existing institutions or creating new institutional arrangements or both (Nabli and Nugent, 1989:1339). If the calculated transaction costs include political changes such as granting a municipality water authority status, the costs could include the costs perceived to be necessary by political agents to initiate and effect changes. Related questions will be the role of the National Ministry Responsible for Water and Sanitation in relation to the decentralised municipal water and sanitation authority. Saleth and Dinar (2004) incorporate the role of institutional linkages in institutional transaction cost frameworks and elaborate on endogenous and exogenous factors pertinent to water and sanitation governance. Endogenous factors are internal to water and sanitation sectors and institutions, and exogenous factors are outside the strict confines of both water and sanitation and related institutions (Soderbaum, 1990:485, Saleth, 2004:8, North, 1993:5, Richter, 2003:10).

The endogenous factors related to water and sanitation sectors include water scarcity, water conflicts, financial and physical deterioration, service levels, and water- and sanitation-related ecological effects such as water logging and salinity. The same factors related to water and sanitation institutions include institutional linkages and path dependency. The exogenous factors include economic development, demographic

growth, technical progress, economic and political reforms, environmental crisis, international commitments, donor roles, and natural disasters such as floods and droughts. The effects of both exogenous and endogenous factors are tracked within the institutional transaction cost framework by conceptualising them as part of either the transaction costs or the opportunity costs of institutional change (Soderbaum, 1990:485, Saleth, 2004:8, North, 1993:5).

3.3.3 Institutional evolution

In implementing IWRM, a number of new institutions were created and this institutional evolution promoted water and sanitation scarcity in rural areas of Africa. Richter (2003:7) warns that institutions do not evolve to only increase efficiency, but also to increase the wellbeing of powerful groups that exploit other groups, even when efficiency suffers. Institutions evolve for many reasons, including the arrangements created and exploitation of weak groups. There is a distinction between institutional environments and institutional arrangements. Institutional environment refers to the background constraints or rules of the game that guide an individual's behaviour. These can be both formal explicit rules (constitutions, laws, property rights), and informal often implicit rules (social conventions, norms). While these background rules are the products of, and can be explained in terms of the goals, beliefs, and choices of individual actors, the social result (the rule itself) is typically not known or designed by anyone. Institutional arrangements are specific guidelines or governance structures designed by partners to mediate particular economic relationships. Business firms, long term contracts, public bureaucracies, non-profit organisations, and other contractual agreements are examples of institutional arrangements (Klein, 1999:458, Richter, 2003:9, 17).

The institutional environment forms the framework in which human action takes place. Institutions reduce uncertainty by providing a structure to everyday life. They define and limit the set of choices individuals have. Institutional constraints include both what individuals are prohibited from doing such as discharging effluents into rivers, and under what conditions individuals are permitted to undertake certain activities e.g. diverting a river or water resources that can only be done by an institution with a license to do so.

Rules of the game are by-products of individual choices rather than deliberately defined through collective action (Klein, 1999:459, Richter, 2003:9, 17). Institutions of governance are studied in the context of institutional environments, institutional arrangements, and their social embedded-ness (social structure and ideology). Social embeddedness includes a comprehensive system of cognitive and moral beliefs that shape institutions (Richter, 2003:18, Granovetter, 1985:5).

3.3.4 Constitutional choice

In Ghana, Malawi, and South Africa the state is the custodian of water and sanitation rights. The constitutions of these countries recognise water and sanitation services as fundamental human rights. Property rights are in line with this constitutional choice. The state plays an important role in enforcing contracts and property rights through the establishment of a suitable constitution (Richter, 2003:20). Constitutional choice is a method that can be used to minimise opportunism and misbehaviour, both upstream and downstream. The state is the sovereign, the supreme authority that has the power to give orders, to make law, and to administer law. It can raise revenue by imposing taxes, it has monopoly over the use of coercive force, and it may require of its constituents to fight in wars and risk death. The state specifies and elaborates on the property rights structure and is ultimately responsible for the efficiency of these structures (Fiani, 2004: 1014).

The state provides economies of scale and services such as the administration of justice and the enforcement of property rights and contracts which could be expensive for private agents to provide as protection for themselves. The enforcement of property rights and contracts increases society's revenues and produces savings to be divided between the state and society (North, 1981:18). The state performs such functions through employees, members of parliament, courts, a police force, service providers, and councillors. The constituents of the modern state change as a result of elections that put new political parties in power and usher in new administration (North, 1990: 49).

On the other hand a private firm is not sovereign; it is not allowed to use coercive force towards its business partners and has to obey the laws of the state. It can gain revenue

only through trade and not through levies on production costs (Richter, 2003:20). North's analysis of the constitutional choice is embedded in the theory of institutions which has three building blocks, namely (i) the theory of property rights that describes the individual and group incentives in the system, (ii) the theory of the state that focuses on the role of the state in specifying and enforcing property rights and (iii) the theory of ideology that explains how different perceptions of reality affect the reactions of individuals to changing objective situations (North, 1981:7, Fiani, 2004:1014).

3.3.5 Law and economics of contracts

The implementation of IWRM supports the creation of new institutions, institutional frameworks, water laws, and new contractual obligations. Institutions of principal interest to the new institutional economists include the institutional environment (or rules of the game, laws, politics, judiciary, laws, contract, and property) and institutions of governance (or play of the game, the use of markets, hybrids, firms, and bureaus) (Soderbaum, 1990:483, North, 1991, Williamson, 1998:75). The emergence and evolution of these rules is understood in terms of the motivations and decisions of the individual actors in the collectivity (Richter, 2003:10). Externally imposed rules and monitoring can reduce and destabilise co-operation or even completely destroy it (Ostrom, 2000, van den Bergh, 2007:530).

There is a need to set up institutional arrangements or governance frameworks to protect transacting parties from the hazards associated with exchange. For example expecting district assemblies in Accra to contribute 5% installation fees and communities to contribute 5% operation and maintenance fees as part of the conditions put forward by donors, was contractually impossible to implement. This should have been done through contractual analysis and a review based on realities. The governance approach is distinguished by its emphasis on contracts. A complete contract specifies a course of action, a decision, and terms of trade contingent on every possible future state of affairs. All complex contracts are incomplete since the future is unknown, uncertain and risky (Richter, 2003:14). Such risks and uncertainty limits the available contract options. The economics of contract models proposes the use of relational and implicit contracts.

Relational contract is an agreement that describes shared goals and a set of general principles that govern the relationship. An implicit contract is an agreement that, while un-stated, is assumed to be understood by all sides (Klein, 1999:466-467, Fiani, 2004:1008).

There is evidence in Malawi of bilateral dependence (donors) in water and sanitation budgets and mal-adaptation of contractual obligations when the institutions decided to change service providers. If contracting parties are unable to adapt to changing institutional arrangements associated with incomplete contracts, this may result in mal-adaptation and cause problems (Williamson, 1991). Mal-adaptation costs are imposed by bilateral dependence, weak property rights, measurement difficulties, and/or over-searching, inter-temporal issues that can take the form of disequilibrium contracting, real-time responsiveness, long latency and strategic abuse, and weaknesses in the institutional environment. To overcome this, agents seek to match appropriate governance structures with the particular characteristics of a transaction (Klein, 1999:468). New institutional economists (especially transaction cost economists) favour informal agreements as a way of resolving contractual conflicts compared to formal legal centralism (Klein, 1999:475, Richter, 2003:14, Fiani, 2004:1008).

Williamson's transaction cost economic (TCE) theory is a theory of contracts under conditions of uncertainty and asymmetric information, where legal enforcement and self-enforcement complement one another. Both court ordering and private ordering characterise the governance structure or organisation of non-standard contractual relationships (Richter, 2003:15). The state exists as a supreme authority that has the power to make, specify, and enforce laws (Richter, 2003:20, Granovette, 2003, Fiani, 2004:1004, 1009). Political and economic institutions assign and enforce property rights (Fiani, 2004:1006). North (1993) regards informal institutions as pervasive, but acknowledges the role played by both informal and formal institutions in the enforcement of property rights and contracts. Social norms and conventions interact with legal rules established by the state (Fiani, 2004:1013-1014). Property rights require the customary

and legal apparatus of recognition, adjudication, and enforcement. The state plays an important role in the establishment, enforcement, and adjudication of property rights.

3.3.6 Theory of institutions

The study of economic institutions needs to make provision for the conditions of societal embedded-ness and the attributes of human actors (Williamson, 1998:75). These are regarded as background factors. Saleth (2004) highlights three categories of institutional theory, namely evolutionary, market-based, and bargaining theories. Evolutionary theories explain the emergence of social conventions and survival in terms of social, cultural, and economic factors; market-based theories such as public choice and transaction cost theory emphasise institutional selection through competition; and bargaining theories explain institutions in terms of the asymmetries of power (Saleth, 2004:7).

All three elements are visible in Ghana and Malawi, where the implementation of IWRM has resulted in the establishment of new institutions such as CWSA, WRC, WRB, EPA, and the Lilongwe Water Board. The above institutions have evolved out of IWRM institutions which propagated the creation of new water institutions. The IWRM principle of recognising water as an economic good resulted in water and sanitation institutions being market-orientated, commercialised and a replacement of state institutions with water and sanitation markets and vending in Ghana. There has been bargaining for allocations and rights amongst various water users such as agriculture, industry, navigation, domestic users, food production, and environment within IWRM platforms. A legal framework ought to have been created to deal with the unhealthy contestations and bargaining for allocations by one user at the expense of others.

3.4. Environmental economics

In the implementation of IWRM in the domestic water and sanitation supply cycle, there is an interface between service provision and pollution. Asafu-Adjaye (2000:121) notes that there is an increasing need to link the protection of natural resources with economics. Water and sanitation governance needs to be linked to new institutional and

environmental economics (EE). There have been efforts to design and implement market-based solutions which rely on the use of traditional economic concepts. Market-based instruments in the area of environmental management, including water supply and sanitation governance, have been promoted as providing less costly policy options, and as easier to implement devices requiring less policing. Environmental economics provides the theory and logic behind arguments about the use of economic incentives and disincentives in environment and natural resource management. Environmental economists focus on the true value of environmental assets and of environmental damage, renewable resource use, and ecosystem management (Soderbaum, 1990:483, Asafu-Adjaye, 2000: 121, Pearce, 2002: 57, van den Bergh, 2007: 521).

Environmental economics started in the USA in the 1950s and late 1960s after the establishment of Resources for the Future, an NGO which developed and applied welfare economics to a large array of environmental issues. Later in the 1980s most environmental economics embraced ecological economics, agricultural economics, and resource economics (Cropper and Oates, 1992:675, Pearce, 2002:57, Spash, 1999:414, 418, van den Bergh, 2007:524). Environmental economics theory arose because of the failure of neo-classical economists to deal with externalities, the poor application of cost-benefit analysis in market-oriented economic systems, and because neo-classical economists, revisionists, and market-friendly economists were not factoring pollution and environmental degradation into their economic analysis (Soderbaum, 1990:483, van den Bergh, 2007:522, Chapman, 1973:1414, Pindyck, 2007:45, Cropper and Oates, 1992:675). Environmental economics has proven to deliver fundamental critique on mainstream economics. Dissatisfaction with neo-classical mainstream theory was an important reason for the emergence of environmental economics (van den Bergh, 2007: 522).

In the neo-classical framework, the availability of natural resources in general is not seen as a fundamental hindrance to economic growth. Environmental problems are only described as negative externalities and the effects on economic agents external to the centre of the market theory. Neo-classical economics suggests that values are exclusively

found in the market, based on the individual preferences of economic agents (Bromley, 1978: 44, Samir, 1998: 214, Cropper and Oates, 1992: 675). Environmental economists argue that economists should pay more attention to the value of economic goods than is currently the case, using traditional valuation methods based on market prices. This requires setting ecological standards derived from insights into the functioning of eco-cycles combined with ethical views regarding the quantity and quality of the natural resources that we would like to leave behind for future generations (Dietz and Van der Straaten, 1992: 44, Schaltegger and Synnestvedt, 2002: 341, Pearce, 2002: 61, Cropper and Oates, 1992: 675).

Environmental economists present alternative economic views to that of neo-classical, revisionist and market-friendly economics. Just like new institutional economics and water and sanitation governance, environmental economics regards institutions as the basis for economic analysis. The institutional analysis of environmental problems is premised on multi-dimensional, multi-disciplinary, non-monetary, social, and cultural issues and the complexity, uncertainty, and irreversibility of the ecosystem (Soderbaum, 1990: 484, Spash, 1999: 415).

The economic process is described as an open system, having various impacts on the ecological system. Economic theory is built on the notion that production and consumption possibilities depend completely on the current quantity and quality of the natural resources available, while the current and future quantity and quality of the natural resources available is affected by current production and consumption processes (Bromley, 1978: 43, Samir, 1998: 213). In the theoretical framework, room is needed for ethical judgements, as already mentioned, concerning the quantity and quality of natural resources we would like to leave behind for future generations. This requires redistribution of ecological utilisation space (Bromley, 1978: 43, Pearce, 2002: 61). The theoretical framework must be suitable for analysing the forces in society which obstruct sustainable development. Institutional barriers for attaining sustainability must be analysed (Chapman, 1973: 1414, Dietz, and Van der Straaten, 1992: 44, Schaltegger and Synnestvedt, 2002: 340, Pearce, 2002: 61).

The focus of environmental economics is on sustainable development, where the key issue is on ensuring that we protect the interests of future generations. The focus on economic evaluation is based on cost benefit analyses and the choice of policy instruments such as pollution taxes. The other focus area is physical and economic scarcity where a distinction is made between water as a resource and institutional factors that inhibit certain segments of the population from getting access to water. IWRM implementation requires adopting water efficiency plans and it is therefore imperative that states consider ecological efficiency, environmental performance, and measures to deal with externalities and diseconomies (Chapman, 1973:1414, Spash, 1999:421, van den Bergh, 2007:541, Schaltegger and Synnestvedt, 2002:341, Pindyck, 2007:45, Cropper and Oates, 1992:675). There is an overlap in the body of knowledge shared by environmental economists and ecological economists. Ecological economists extend the work initiated by environmental economists. Ecological economists regard environmental problems as far more serious, place more emphasis on the limits set by the carrying capacity of the earth, and advocate anti-growth as a means of keeping world economic systems within the bio and geo-physical limits of the earth (Pearce, 2002:76, Spash, 1999:414, van den Bergh, 2007:524).

Ecological economists also stress the role of the second law of thermodynamics, namely increasing entropy, and stress the importance of making the economic system consistent with maximum recycling and maximum use of renewable energy (van den Bergh, 2007:525, Samir, 1998:214, Ayres, 1998:190). Ecological economists further reject the smoothness of the various production functions in neo-classical economics and also reject the monetisation of environmental damage, based on the fact that there are no substitutes for the environment. Ecological economists and environmental economists emphasise sustainable development, i.e. the preservation of the environment and the protection of the rights of future generations (Pearce, 2002:77, Spash, 1999:418). Their central objectives are to combine knowledge across the specialist areas of ecology and economics and to ensure that policy advice on environmental problems is formulated on this basis. Ecological economists also call for mainstream analysis of the social aspects of

environmental policies and wider consideration for the role of humans in the environment (Spash, 1999:423, van den Bergh, 2007:524, Ayres, 1998:191). Ecological economics integrates the elements of economics, ecology, geography, political science, thermodynamics, ethics, and various other natural and social sciences. It represents a pluralistic, multi-disciplinary and eclectic approach, aimed at incorporating the best of all possible worlds. The link between water and sanitation governance theories, new institutional economics, and environmental economics, constitutes a recognition of a need for institutional frameworks and a rejection of the free market system's notion of educating individuals to act as selfish hedonists and create self-perpetuating power structures which only reinforce inequity (Samir, 1998:214, Ayres, 1998:193, Spash, 1999:428, van den Bergh, 2007:524).

3.4.1 Eco-efficiency and sustainability

There is a link between Local Agenda 21 and IWRM as far as sustainable development is concerned, as recognised by the proponents of ecological efficiency. The ecological efficiency theory that most scholars (Soderbaum, 1990:488, Quiggin, 2000:21, Schaltegger and Synnestvedt, 2002:343, Pearce, 2002:61) use is sustainability. Eco-efficiency is the combination of economic and environmental performance where management is the trigger between environmental and economic performance (Schaltegger and Synnesvedt, 2002:343). Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Pearce, 2002:61, Munasinghe, 1993:126). Soderbaum (1990:488) uses sustainable development together with qualitative growth, eco-development, ecological ethics, and ecological imperatives for public policy. The three main concepts of sustainable development are economic, ecological, and socio-cultural (Munasinghe, 1993:126).

There is a need for water and sanitation schemes to be sustainable. This is achieved through operation and maintenance, environmental management, proper management of waste water treatment plants, promulgating by-laws to prevent effluent discharges to water sources, and holding polluters accountable. All of these motives and drivers for

sustainable development are lacking in most countries including Ghana, Malawi, and South Africa. The economic approach to sustainability is based on the maximum flow of income that could be generated while at least maintaining the stock of assets which yield these benefits. The ecological view of sustainable development focuses on the stability of biophysical systems, especially the viability of sub-systems that are critical to the global stability of the overall ecosystem. The socio-cultural concept of sustainability seeks to maintain the stability of social and cultural systems, includes intra-generational equity, elimination of poverty, inter-generational equity, and the rights of future generations (Munasinghe, 1993:126, Pearce, 2002:61).

The most popular model is sustainable yield which treats sustainability as the property of growth paths for the economy as a whole. Alternatives to gross domestic product (GDP) and net national product (NNP) are explored. Sustainability is premised on the notion that the interests of future and current generations should be treated as equal. Such equalisation of future and present interests is based on decisions affecting the long-term future. Earlier proponents of sustainability such as Ramsey (1928), focused on savings rule and old growth theory, based on the continuous improvement of living standards. The current level of corporate environmental protection is not only economically sustainable, but environmental protection also has a beneficial effect on the utility's economic success (Munasinghe, 1993:126, Schaltegger and Synnesvedt, 2002:341, Pearce, 2002:62). Most countries across the globe use GDP and NNP as indicators of economic growth; African states have very weak environmental management policies and practices.

Environmental degradation could lead to lowering or depreciating living standards for future generations and therefore a call for equitable redistribution for both generations is made (Quiggin, 2000:22, Munasinghe, 1993:127, Soderbaum, 1990:484). Sustainability is based on the premise that natural resources such as water do not have substitutes and therefore depletion is not compensated; not even the internalisation of externalities such as paying pollution taxes can be a substitute for environmental degradation; the optimal discount rate is negative or zero (Quiggin, 2000:22, Munasinghe, 1993:128).

Unsustainable practices arise as the result of inappropriate marginal discount rates; sustainability means restoring natural capital such as water flows, ecological reserves, and water quality (in the case of dams and rivers). Even if EPA ordered Gold Fields Tarkwa to stop operating without the water permit and further ordered them to build a waste water treatment plant, the damage caused to the ecosystem in Ghana may not be reversible (Quiggin, 2000:23, Pindyck, 2007:45).

Ecosystems can be irreversibly lost to future generations. Environmental problems are extended in time, often across administrative boundaries and sectors. Environmental problems caused by a municipality that mismanages a waste water treatment plant such as the case in Accra where 32 out of 35 WWTPs in Accra are dysfunctional, could affect other municipalities, agricultural and economic sectors, industry users, and domestic which means that sustainable development is critical. Environmental costs and benefit functions are highly non-linear, impose sunk costs on society, and involve various levels of uncertainty such as physical and ecological processes, economic impacts of environmental damage, and technological changes that ameliorate economic impacts such as health impacts, lost consumer and producer surplus, lack of social benefits and uncertainty over costs and implications for policy design (Soderbaum, 1990: 484, Pindyck, 2007: 49).

3.4.2 Environmental performance

In implementing IWRM it is imperative that economic performance is linked to environmental performance. Schaltegger and Synnestvedt (2002) argue that there is a link between economic performance and environmental performance. Environmental issues influence both the costs and income of a company and have a direct influence on the economic success of a company. In this regard, good economic performance drives environmental performance. Citizens are willing to pay for water and sanitation services if both quality and quantity is guaranteed (Sagoff, 2000:1426, Munasinghe, 1993:127). The willingness to pay for environmentally friendly services depends on environmental and health regulations, and stakeholder pressure to maintain acceptable quality standards that are developed and enforced at a country level. In other words the economic

performance of a water and sanitation utility is dependent on its environmental and health performance (Schaltegger and Synnestvedt, 2002:340, Sagoff, 2000:1426, Munasinghe, 1993:127, Pindyck, 2007:46).

There is also a perception that economic disincentives for corporate environmental protection stem from companies placing more focus on maximising short-term profits than on the environment. Companies, especially water and sanitation utilities have high levels of environmental impact and should have economic incentives to incorporate a degree of environmental protection. Proper operation and maintenance of waste water treatment plants, protection of ground water, and environmental accountability are some of the responsibilities of water and sanitation utilities both state-run and private-operated. Many seek to ensure that they are economically efficient first and in the process disregard environmental and health issues (Schaltegger and Synnestvedt, 2002:342, Soderbaum, 1990:484).

Optimum environmental performance is achieved if a water and sanitation utility establishes environmental cost accounting, sets up investment appraisal and other environmental information management systems to gather and analyse data, and come up with ecological control systems designed to strengthen the successful implementation of efficiency measures. Such ecological control measures should ensure that production processes are optimised to reduce costs through environmental tools which support the identification of eco-efficiency potentials and the successful implementation of eco-efficiency enhancing measures. In the case of water and sanitation services, it is imperative for utilities to facilitate choices of ecologically efficient technologies such as a toilet facilities that only require six litres of water to flush instead of twelve which is both economically and ecologically inefficient (Schaltegger and Synnestvedt, 2002:345, Soderbaum, 1990:484).

3.4.3 Physical and economic scarcity

Massarutto (2007:2) traces scarcity from its neoclassical economic principles. Water and sanitation services are scarce, which means making choices among various alternatives.

Allocative choices imply trade-offs that depend on existing sets of rules, property rights, and management systems that are socially acceptable and sustainable in the long term. Water scarcity is a country's water footprint; the total volume of water needed to produce goods and services consumed by the people in the country divided by the country's total renewable water resources (Hoeksta, 2006:20, Spash, 1999:415, Munasinghe, 1993:126). Scarcity of water and sanitation services is twofold: physical and economic scarcity.

Physical scarcity deals with issues of water availability and is constrained by hydrological factors: the opportunity costs of water and sanitation, the costliness of water services, the construction of water pipes for reticulation, the availability of waste water treatment plants, the availability and management of purification plants, sufficient water to flush toilets, and the availability of water storage facilities with sufficient quantities of bulk water to be reticulated for domestic consumption. Pearce (2002:60) argues that water supply is finite and can only provide a sustainable future if it is re-used and recycled. Economic scarcity refers to a set of institutional rules, property rights, and shared cultures in any given historical context; and appropriate regulatory systems and institutional mechanisms. The institutional setting represents the ultimate constraint, determining in the short-medium term which governance problems are capable of being solved (Saleth and Dinar, 2004, Pearce, 2002: 60).

Scarcity may be caused by existing institutions not being able to achieve an acceptable solution to governance problems. In most African states, with the exception of North and South Africa, scarcity is the result of a lack of institutional mechanisms rather than a lack of water and sanitation resources. African scarcity is therefore due to governance and institutional factors rather than physical factors; it is man-made (Massaruto, 2007:3). The incapacity to develop appropriate sets of property rights can be traced back to the phenomenon known as the tyranny of the status quo.

3.4.4 Externalities

In implementing water and sanitation utility projects, local government institutions tend to pollute the environment. Stavins (2004:1) argues that the fundamental theoretical

argument for government activity in the environmental realm is that pollution is an externality, an unintended consequence of market decisions which affects individuals other than the decision-makers. Providing incentives for private actors to internalise the full costs of their actions is the theoretical solution to the externality problem (Weber, 2001:53). Van den Bergh (2007:529) refers to selection pressure that often reduces biodiversity in the population as inter-temporal externality.

Diets and van der Straaten (1992:28) explain the neo-classical and environmental economics view of externalities. Neo-classical economists view environmental problems as external diseconomies which prevent natural resources available from being used in accordance with the preferences of economic agents. An external diseconomy is defined as the production of negative by-products by one or more economic agents. These by-products, though unwanted and unasked for, are delivered unintentionally and behind the back of the market by one or more economic agents. The loss experienced by the victims is not regarded as a cost-item by the originator of the external diseconomy. As a result, the cost of exploiting the environment has been consistently underestimated. Nature is consequently more harmed by production and consumption than were the economic agents' intentions (Munasinghe, 1993:127, Cropper and Oates, 1992:676, Chapman, 1973:1415, Diets and van der Straaten, 1992:28, Bromley, 1978:44, Pearce, 2002:58).

Unlike neo-classical economists, environmental economists focus on dealing with externalities. Kapp (1950) attacks the portrayal of environmental problems as externalities rather than pervasive social costs resulting from the structure and incentives under free markets. He also rejected the principle that social costs and benefits are quantitatively comparable (Ayres, 1998:190, Spash, 1999:417, Bromley, 1978:44, Pearce, 2002:61). Kapp further rejects Ronald Coase's view that in a bilateral bargaining environment where there are no transaction costs, wealth or income effects, or third-party impacts, two negotiating parties will reach socially desirable agreements and the overall amount of pollution will be independent of the assignment of property rights. He agrees with later institutional thinking promoted by NIE (Stavins, 2004:1, Bromley, 1978:44). Even before the era of environmental economics, there were scholars such as Arthur

Pigou who included externalities in their analysis. The primary advocate of externality is Arthur Pigou, who in *The Economics of Welfare* (1920) proposes that governments should impose tax on emissions equal to the cost of the related damages at the efficient level of control (Pindyck, 2007:53, Cropper and Oates, 1992:680, Stavins, 2004:1, Pearce, 2002:58). This Pigovian approach to externalities was replaced in environmental economic thinking by Coasean property rights which is embraced by NIE advocates such as Douglas North and others. The Pigovian tax system (as externalities are sometimes called) are still used by many environmental and ecological economists (Quiggin, 2000:14, Cropper and Oates, 1992:680).

The central issue in environmental economics is how to reduce external diseconomies. The state corrects market failures by imposing taxes on the production of external diseconomies and by subsidising the production of external economies, for example the purification of processing water (Pigou, 1924, Bromly, 1978:43, Cropper and Oates, 1992:680, Pearce, 2002:58). The external economy, in this case the natural resource used, receives a shadow price which is included in the agents' private cost-benefit calculations. An externality is said to persist whenever the costs of change exceed the anticipated gains (Bromley, 1978:45, Cropper and Oates, 1992:680, Pearce, 2002:58). If shadow prices are set at the right level, a Pareto optimum exploitation of nature, i.e. pollution of the environment and depletion of natural resources in accordance with the preferences of economic agents, is considered possible (Weber, 2001:53, Cropper and Oates, 1992:680, van den Bergh, 2007:541, Quiggin, 2000:15, Bromley, 1978:45).

In Ghana, Malawi, and South Africa pollution measures embrace the principle of polluter pays, but the implementation and enforcement of environmental management laws remain market-related and therefore counter-productive. State interventions typically deal with externalities through taxes, levies, and subsidies which are imposed to internalise externalities. They do so by equating the marginal private cost of externality-generating activities with the marginal social cost, based on Pigovian neo-classical welfare economics (Hahn, 2000:376, Quiggin, 2000:15, Bromley, 1978:45, Pearce, 2002:58, Cropper and Oates, 1992:680, Weber, 2001:55). This is an improvement on Coase's

problem of social cost which advocates for both the polluter and the victim of the pollution to pay. In this model the creator of the externality pays a pollution tax, whilst the sufferer also pays the polluter not to pollute. The polluter could pay if he or she is a high income agent and the sufferer is a low income agent. The Coasian proposal of a negotiated settlement arrived at by polluters and victims of pollution is problematic in the sense that pollution involves a large number of agents and victims and the transaction costs are too large (Weber, 2001:53, Cropper and Oates, 1992:680, Pearce, 2002:61).

A good example is the oil refinery complex located in South Durban. If they exceed sulphur dioxide emissions the refineries pay a maximum amount of R20 000, according to Ethekewini Municipal Bylaws. For a school child attending Settlers Primary School in Merebank, it is their responsibility to pay the health bills when they suffer from asthma, because oil refineries already paid a fine for exceeding globally accepted sulphur dioxide emissions. The National Environmental Management Act has a clause calling for polluters to pay, however low income agents pay for their health costs, whilst polluters only pay fines for air pollution and not related health costs.

Examples of pollution charges are: effluent charges, product charges, administrative charges, and tax differentiation. Grants and subsidies such as soft loans and tax allowances are also given to industries as incentives to reduce pollution. Other pollution control measures which are also market-based instruments are new incentive generating instruments such as deposit-refund systems and marketable pollution rights (Hahn, 2000:376). Cropper and Oates (1992:681) highlight two alternative policy instruments, namely unit subsidies and marketable emission permits. The key argument is that subsidies increase the profits of polluting industries whereas taxes decrease profits. The subsidy approach shifts the industry supply curve to the right, while taxes shift the supply curve to the left with a consequent contraction in the size of the industry. Market emission permits are issued by environmental authorities to companies who could even bid for them. The emission permits are equal in the aggregate to the efficient quantity, and the regulator sets either a price or quantity (Weber, 2001:55, Cropper and Oates, 1992:682, Weber, 2001:53, Pindyck, 2007:53). The other category of instruments called 'process reforms' includes accountability mechanisms such as peer reviews, judicial

reviews, sunset provisions, and regulatory budgets and requirements, to provide better information to the public and regulatory institutions (Hahn, 2000:379). None of the above market instruments factor in the compensation of victims of pollution (Cropper and Oates, 1992:680, Diets and van der Straaten, 1992:29, Stavins, 2004:3, 9).

The weakness of the above financial instruments is that they lack physical terms such as emission reduction standards, emission and discharge standards, and product and process requirements, and may also make all resource users worse off unless the tax (revenue) is returned to users (Quiggin, 2000:16). The financial instruments also lack enforcements, regulatory institutional frameworks, sanctions to deal with transgressions, and social costs (Diets and van der Straaten, 1992:31, Pearce, 2002:61). The other weakness is that the cost benefit analysis used to reduce pollution is based on market prices and not on hedonic pricing or contingent valuation methods. The cost of pollution abatement is usually convex; the reduction of pollution is small and therefore the benefits are meagre. If the pollution abatement is great and concave there is a likelihood of having more incremental benefits than costs. With weak enforcement mechanisms, there is always a likelihood of having convex pollution abatement (Stavins, 2004:4, Pearce, 2002: 59, Cropper and Oates, 1992:677, Pundych, 2007:54).

It is part of the AfDB funding conditions to conduct environmental impact assessments (EIA) and strategic environmental impact assessments, and most countries including Ghana, Malawi, and South Africa have promulgated laws and regulations which promote EIAs. However, such processes are based on cost-benefit analysis and are therefore problematic. Van den Bergh (2007:524) notes that the technique of cost-benefit analysis (CBA) is used to evaluate investment projects with significant environmental impacts. The focus on monetary accounting through CBA stimulates the development and application of monetary valuation techniques such as hedonic pricing, travel costs, and contingent valuation to value environmental changes, damages, projects, and policy scenarios (Cropper and Oates, 1992:677, van den Bergh, 2007:524, Munasinghe, 1993:127).

Hedonic wage studies, averted behaviour, and contingent valuation, provide estimates of marginal willingness to pay or willingness to accept small changes in mortality risks, and such estimates can be normalised as the value of a statistical life (VSL). The contingent valuation method uses survey techniques to establish the value of goods and services which are not exchanged in markets and therefore are not associated with market prices (Cropper and Oates, 1992:677, Stavins, 2004:4, van den Bergh, 2007:524, Sagoff, 2000:1427, Pearce, 2002:59, Munasinghe, 1993:127-128, Soderbaum, 1990:483). The willingness of households in Ghana and Malawi to pay operation and maintenance fees is very low and there is an increase in subsidising the poor since capital cost contributions are not forthcoming from either households or district assemblies.

There are neither prices nor markets for public goods such as the ecosystem and restoration of river health and wetlands. Although the above mentioned cost-benefit methods are recommended by environmental economists, they are weak when it comes to willingness to pay for environmental quality and the safeguarding of natural resources for future generations. Such weaknesses make the real value of levies and penalties difficult to calculate and stipulate. Without such realisation of actual human and industrial impacts of externalities, delayed impacts on the environment, combined with a lack of synergistic effects that could reduce emissions and relations between emissions and immissions, make it impossible to prevent or mitigate ecological calamities (Soderbaum, 1990:487, Cropper and Oates, 1992:677, Dietz and van der Straaten, 1992:34, Quiggin, 2000:31, Pearce, 2002:59, Soderbaum, 1990:484, Pindyck, 2007:47).

3.5. Conclusion

The inclusion of water and sanitation governance theory is relevant in analysing IWRM as a governance model and a useful tool to analyse the institutional frameworks of each country case study. Collective action as a water and sanitation governance theory is useful in understanding the role of communities in providing solutions to their water and sanitation problems as well as their participation in changing existing institutional arrangements. The principles of water and sanitation governance are useful in analysing the various principles of IWRM from the Dublin era to the current dispensation. It is also

important to establish whether IWRM platforms advocate transparent, open, participative, accountable, effective, coherent, efficient, communicative, equitable, ethical, and sustainable processes. It is equally important to link water allocations with relevant property rights regardless of whether the providers are private or public or the stakeholders represent energy or agriculture.

An analysis based on centralisation and decentralisation was useful in establishing the merits and demerits of each. NIE is also useful to establish whether the transaction and information costs of environmental impacts assessments and service provision are in support of local communities or perpetuate scarcity. Institutional evolution is useful in reflecting on various institutions and constitutional choices that evolved from IWRM implementation. The law and economics of contract is relevant in explaining water and sanitation cut-offs that households often experience as a result of market forces that shape IWRM implementation. Including ecological efficiency and sustainable development is useful in explaining pollution abatement measures that benefit not only current, but also future generations.

Environmental performance linked to the willingness to pay for environmentally sustainable products is a bone of contention in various parts of the world. Most bureaucrats in Africa and elsewhere are of the view that water is physically scarce and ignore institutional and economic scarcity. Water and sanitation projects are always associated with externalities which make environmental economics a useful analytical tool. In sum, this chapter provided the theoretical foundation for the analysis of various African case studies presented in chapter 4 and links with the literature survey on IWRM in chapter 2 and the conclusions drawn in chapter 8. The next chapter provides relevant information on project documents, the context of each case study, and various debates on IWRM implementation in Africa.

Chapter Four

IWRM within the AfDB and other development banks

4.1 Introduction

In 1987 when the Mpira water scheme was completed in Malawi, IWRM was not yet an official policy of the AfDB and the World Bank. In the late 2000s when urine diversion toilets were introduced in Durban, South Africa had already hosted the World Summit on Sustainable Development (WSSD) in which an IWRM plan of action was agreed upon. Durban also hosted the Second Africa Sanitation Conference in 2008 in which each African country present agreed to set aside half a percent of its GDP and allocate it to sanitation. In 2006 when the AfDB funded the Accra Sanitation Improvement Project (SIP), many changes were already taking place in the water and sanitation sector in Africa and the World. This chapter explores the thinking within AfDB regarding policy shifts and the role of the World Bank and other institutions which influenced the shift.

This chapter also provides information about the case studies and the rationale for choosing Ghana, South Africa, and Malawi as case studies. Hydro-politics and the broader political economics of IWRM in Ghana, South Africa, and Malawi, as well as project documents will be summarised in this chapter. In Ghana important legislation supporting the implementation of IWRM includes the Water Resources Commission (WRC) Act No. 522 of 1996. This act created the Water Resources Commission responsible for the regulation and management of water resource utilisation. The Commission also proposed comprehensive plans for the utilisation, conservation, development, and improvement of water resources. The other key functions of the WRC are to initiate, control, and co-ordinate activities connected with the development and utilisation of water resources, grant water rights, and monitor and evaluate programmes for the operation and maintenance of water resources (Government of Ghana, 1996: VII-4003). The Water Resources Act of 1969, the Water Works Act of 1995, and the Water Resources Bill of 2012 (shelved until the 20 May 2014 elections) are some of the legislative measures that support the implementation of IWRM in Malawi. As much as

some of the above institutions existed prior to the introduction of IWRM as a policy condition, it can be argued that the Dublin Conference of 1992 played a significant role even before the AfDB adopted IWRM policy.

IWRM is premised on the decentralisation and management of water resources at the lowest level possible. The Local Government Act of 1993 (Ghana) and the Decentralisation Act of 1998 (Malawi) are therefore essential in creating an enabling environment for decentralisation. In order to bring about an enabling environment for the implementation of IWRM, the member states of the UN were expected to craft water and sanitation policies that support the implementation of IWRM. The Government of Malawi promulgated a National Water Policy (2005) as well as a National Sanitation Policy (2007) both of which elaborate on the roles of various institutions such as the Ministries Responsible for Water, Irrigation, Agriculture, Natural Resources, Health, and Meteorological Services, in water supply and sanitation. Both policies also elaborated on the roles of the National Water Resources Authority, Water Utilities (created as a result of the promulgation of Water Works Act of 1995), local governments (elections of councillors was scheduled to take place for the first time on 20 May 2014), NGOs, the private sector, and other public institutions in water supply and sanitation (Government of Malawi, 2008). In Ghana the Water Policy of 2008 and the Environmental Sanitation policy of 1999 serves as key documents elaborating on the roles of the Community Water and Sanitation Agency (CWSA) in rural water and sanitation regulation, the Ghana Water Company Limited in urban water supply, and district assemblies in urban and rural water supply and sanitation delivery.

The Mpira Water Authority is an institution established in Malawi to manage water resources within the Mpira Dam scheme funded through the African Development Bank. This institution was conceptualised in 2008 and only became an important institution in 2011. The following AfDB policy documents serve as guidelines in the implementation of water supply and sanitation projects: Environment, Rural Development, IWRM, Poverty Alleviation, and the Handbook on Stakeholder Consultation and Participation in AfDB Operations. The AfDB policies on IWRM, and Rural Development and

Environment promote private sector participation in water supply and sanitation. These documents served as the structural adjustment programmes which informed the promulgation of the Malawi Growth and Development Strategy (2008), and increased private sector participation in the urban areas of Ghana, and community management in the rural areas. The implementation of IWRM in Ghana and Malawi was informed by the policies of the bank and other donors and not by the internal conditions in each of these countries (AfDB, 2004).

In South Africa, the chosen project is the roll-out of urine diversion toilets to rural households of the eThekweni Municipality. After the dawn of democracy in South Africa, the government promulgated the National Water Act of 1998, and the Water Services Act of 1999, adopted the National Sanitation Strategy, transferred sanitation responsibilities to the Department of Human Settlements in 2009 and then back again to Water Affairs after the May 2014 General Elections. Like all other developing countries, South Africa has been grappling with inadequate sanitation and had begun processes to eradicate bucket latrines by 2007. The introduction of UD's can be seen in the context of IWRM-related changes taking place in South Africa. The concept of catchment management agencies (CMAs) is being implemented in each of the nine provinces of the country, more than one municipality has been placed under one CMA, and water resource management is implemented along with watershed management principles.

A summary of each of the appraisal documents outlining project goals and the extent to which the objectives of the AfDB are advanced, is outlined in this chapter. Since IWRM is a global phenomenon, the analysis of the policy shift towards IWRM is not only limited to the three case countries, but examples in other parts of Africa and the world at large are also explored. The specific case studies in the chosen countries will be dealt with in successive chapters. The first section of this chapter examines debates about policy shifts in the AfDB and the contribution of IWRM in such shifts. The second part of the chapter gives examples of projects in Malawi and Ghana (the case study of South Africa is covered separately with all background details).

There was a major shift in the AfDB regarding water and sanitation after the IWRM was mooted in Dublin in 1992. The shift is linked to the promulgation of IWRM-related strategies by the World Bank in 1994 and the adoption of similar policies by a number of stakeholders in Africa in early 2000s. The development partners active in the water and sanitation sector in Africa include the African Development Bank, the African Partnership Forum, the New Partnership for Africa's Development (NEPAD), DFID, the European Commission, the governments of France and Germany, the Strategic Partnership with Africa, the United Nations Development Programme (UNDP), the United Nations Economic Commission for Africa (UNECA), and the Tokyo International Conference on African Development (TICAD) (Nojiyeza, 2010, 17). All the partners support the new Structural Adjustment Programmes of the World Bank, called Poverty Reduction Strategy Papers. Water and sanitation and IWRM projects are supported through these donors if they are demand-responsive and community-managed, ensure private sector participation, ensure full cost recovery, and ensure that service providers operate along commercial lines and treat water as a commodity (Bond, 2008:63, Nojiyeza, 2010).

The adoption of IWRM strategies by the AfDB in 2000 was based on the fact that the World Bank Water Resources Strategy of 1993 and its updated version in 2004 outlines a development path with regards to water, sanitation, and IWRM which development partners in Africa could follow. The World Bank's Water Resources Strategy of 1993, crafted in line with the Dublin Principles of IWRM, prescribed the design features for water supply and sanitation projects. Some of these features are described below.

There was a shift towards using demand-responsive approaches which replaced strong state interventions. Providers were advised to begin managing services at the lowest appropriate level (decentralisation), adhering to cost recovery policies combined with transparent subsidies for the poor, and using appropriate technologies and standards to ensure cost effectiveness. The decade of IWRM implementation was also characterised by a shift from sewerage to on-site sanitation and hygiene promotion programmes. Member countries tailored management models to their countries' contexts and through

public-private partnerships, recognising that regulation cannot substitute good governance (World Bank Water Resources Strategy, 2004).

Civil society critics of the World Bank, and the African Development Bank and its partners, argue that the Dublin principle of recognising water as an economic good over and above a social good, motivated the World Bank to promote full cost recovery, commodify water, and commercialise state utilities and private sector participation which increased water prices and made water unaffordable in Africa. Some of the critics are members of the Lesotho Transformation Resource Centre and the the Lesotho National Council of NGOs, who reacted to the proposed Metolong Dam with the following comments:

“The prices of water that currently depend on where you live in Lesotho are expected to increase to about R1500 per month and the commercialised water utilities. Rural Water Supply Unit and Lesotho Water and Sewerage Authority are the ones to benefit from Metolong Water Scheme and not the poor people of Mazenod, Teyateyaneng, Maseru, Morija and Mafeteng.”

A similar critique came from the vice chairperson of NAWISA and a lecturer at the University of Zambia’s School of Mining, Chozi Lungu:

“The World Bank in Zambia has always regarded water as a commodity that must be paid for in full. The establishment of Lusaka Water Company at the insistence of the World Bank was a clear indication that the bank and its continental counterpart African Development Bank wish to see Zambians paying fully for every drop of water they consume. It is a condition that the government must comply with before funds are disbursed. No commodification no World Bank funds -take it or leave it.”

Lungu’s views were supported by a water utility official from Malawi’s Central Regional Water Board, who stated:

“There have been some conditions in the design of the project to consider the poor, but the conflict comes when the other condition is that the funding is assessed on the capacity to recover costs, i.e. ensuring financial viability.”

Another World Bank critic, Bond (2008:63), argues that conditions imposed by the bank president James Wolfensohn on the former presidency of Mozambique's Joaquim Chissano in 1998 to privatise municipal water, led to an increase in water prices and a transformation of rural water and sanitation services from a supply-driven to an unsustainable demand-responsive model characterised by community management, cost recovery and involvement of the private sector. In the interpretation of the World Bank, the following stakeholders assisted Africa to improve its water supplies and sanitation: the African Development Bank, the International Development Agency, the new structural adjustment programmes, the PRSPs, the Water and Sanitation Country Assistance Strategies (World Bank), and the Country Strategy Papers (the AfDB version of a PRSP, (IDA Report 2006).

A report by the African Development Bank, the Water and Sanitation Programme, the United Nations Development Programme, the European Union Water Initiative and the World Bank -"Getting Africa on Track to meet the MDGs on Water and Sanitation" (2006), concluded the following about Ghana, Malawi and Uganda with regards to their MDG status:

Ghana has made considerable progress in improving governance, developing policy and institutional frameworks and building capacity in the water sector. However, WSS financing in the past has been about a third of required investments, implying that Ghana could be on track to achieve the MDGs if more funding is made available, and reform efforts are continued ... Malawi is reasonably on track in terms of water supply, but far behind in sanitation. For sanitation, Malawi does not have a sanitation policy or planning documents, it is clear that she is not going to achieve the MDG target of 87 percent sanitation coverage, which would involve about 600,000 people attaining adequate sanitation each year... Overall, Uganda seems to be on track for water supply,

particularly if the 80 percent functionality rate in rural areas is improved, but it is worth noting that only 40 percent of the Medium Term Expenditure Framework Allocation went to rural areas in the 2005/2006 financial year which implies that if this low rate of allocation is maintained Uganda may be off track for both water and sanitation MDGs (AfDB et al., 2006:25, 45, 93).

According to WHO and UNICEF estimates in 2008, 36% of rural Ghanaians lack water and 60% lack adequate sanitation; and 4.4 million Burundians, 5.4 million Malawians, 19.9 million Ugandans, and 8.5 million Moroccans living in rural areas lack adequate sanitation. The World Bank's International Development Association claims that it managed to produce tangible results in Ghana, Uganda, and Senegal in terms of increasing access to water and sanitation.

Urban water projects in Senegal helped usher a reform of the water sector in 1996 which led to increased efficiency and expanded access, particularly for the poor, without increasing water tariffs beyond the rate of inflation. Following the engagement of a private operator in an innovative public-private partnership, water losses decreased from 32 percent to 20 percent between 1998 and 2003. Between 1996 and 2006, access to water supply services was extended to approximately 1.6 million people in Dakar and secondary cities. IDA helped finance 140,000 new household connections at subsidised rates for poor families and 400 public standpipes. Sanitation improved in urban areas with 830,000 people gaining access to sewerage connections or on-site sanitation (IDA at Work Report: 5).

Civil society organisations in Lesotho are not convinced of tangible results accrued from private-public partnerships.

The Metolong dam project is going to benefit urban residents of Maseru, Morija, Teyateyaneng, Mazenod and Mafeteng and the people in the rural areas are not going to benefit from the dam that might displace them. Just like the Lesotho Highlands Water Scheme, the price of water is going to be high, just like the price of electricity. The lesson

of Katse dam water that is sold to South Africa in the name of public private partnerships is bringing about uneasiness in the people of Metolong that they are going to pave the way for a dam that is not going to benefit them. Instead of the people getting access to water and electricity, the Lesotho Government is likely going to earn royalties through the sale of surplus water to South Africa (Lesotho Council of NGOs, 2010, Transformation Resources Centre, 2010).

As far as the World Bank is concerned, decentralisation and a community-driven approach has had demonstrable results in increasing access to potable water to thousands of people in Ghana. The World Bank argues:

In Ghana, the Second Community Water and Sanitation Programme adopted a community-driven approach to water supply, supporting Ghana's decentralisation strategy through grants. More than 2,014 communities are now using and managing water and sanitation facilities that they planned and helped build. Overall nearly 800,000 people in four regions (6 percent of Ghana's total rural population) gained access to potable water. The project also provided training to 500 service providers (IDA at Work Report, p5).

Doe (2007:37) acknowledges that there is improvement in access to water in Ghana, but he questions frequency of flow and sustainability of most of the water schemes. In North Teshie which is part of the area serviced by the Accra Metropolitan Council, water flows on one or a maximum of two days per week. The number of taps that the IDA report refers to are taps that only flow once or twice a week. The water scheme in North Teshie is designed in such a way that water flows on Saturdays and Sundays or Tuesdays and Wednesdays. Water harvesting is a feature on the days when the water flows and households need to harvest enough water for a whole week otherwise they end up purchasing water from vendors. The time of the flow on the prescribed days is not known which is why people camp, even during the night, to wait for the water,

The danger of the IDA analysis of access to water and the community management challenges, is that full cost accounting is not considered. People are billed according to the litres they use per month. According to Doe (2007:41) the majority of households (49%) pay between 50, 000 and 99,000 cedis per month (the current cedi-dollar rate is 1=0.344532 as at 14 May 2014) for water, and the highest amount paid is between 150,000 and 199,000 per month. These high tariffs paid to the Ghana Water Company Limited for water has created a lucrative water vending business and also encouraged illegal connections. Decentralisation and its community management approach is characterised by mal-governance of water in Ghana. Water vendors are maximising profits to the tune of 1000 cedis (US\$350.91) per 15 litre bucket and the profit margin ranges between 138% and 1090%. In practice the pro-poor policies of the World Bank are resulting in poverty accumulation and perpetuation. The thinking within bank circles that low tariffs do not benefit the poor is used to justify increasing tariffs. The other propaganda which the World Bank uses to justify high tariffs, is that the poor are willing and able to pay if the service they get is effective and efficient (Cardone and Fonseca, 2003,31).

A similar trend is visible in Malawi. Two civil society groups provided “An analysis of the Water Supply and Sanitation Sector Financing in Malawi” (Malawi Economic Justice Network and Water Aid Malawi, 2007:15), assessing the funds invested in the sector by AfDB, EIB, JICA, CIDA, KfW, NDF, UNICEF, UNDP, NORAD and DBSA. The organisations came to the conclusion that the Ministry of Water Development budget had mostly been donor-led and urban-focused. The study provides a good overview of the water and sanitation status, coverage, and challenges faced by Malawi in meeting the MDGs. It criticises delays in adopting a sanitation policy, the centralisation of power by the Ministry of Irrigation and Water Development, the lack of pro-poor expenditures, delays in adopting IWRM policy, and off-budget expenditures by NGOs. However, the study did not attempt to investigate the effectiveness of the water supply and sanitation projects (such as the Mpira Balaka Water scheme) in terms of poverty alleviation, nor did it investigate the effectiveness of the Rural Water Supply and Sanitation Initiative, or the AfDB’s contribution to rural poverty alleviation. Studies completed so far do not

investigate the implementation of IWRM in the AfDB funded projects and also do not address alternatives to the popularisation of IWRM. In the Africa Water Scarcity Table (Table 4.1) below, Malawi is rated as one of the countries projected to become water scarce, whereas Ghana is already showing signs of water scarcity and stress, shifting up from the vulnerability status it experienced in the 1990s. Although neither Malawi nor Ghana are expected to be vulnerable, both countries are projected to be *water-stressed*, in other words water availability is projected to be about 1,000 to 1,700 cubic metres per person per annum.

Another shift since the adoption of IWRM as a policy is the massive privatisation and commercialisation of water boards. In a study by Chirwa and Junge (2007: 10), they conclude that the management of water boards should not be privatised if poverty reduction is a priority, and that additional social assistance measures are required to help the poorest to access a minimum level of improved water. They argue that there is a need to hold regular consultations with communities on the implementation of reform measures, and recommend that water boards which extract arrears payments from poor consumers should make restitution.

Chirwa and Junge (2007) as well as MEJN and Water Aid Malawi (2007) consider the constitution of the Mpira Water Authority, the National Water policy of 2005 and the draft National Sanitation policy of August 2007. Ferguson and Mulwafu (2004), DeGabriele (2002), Ng'ongo'la (1999), Njalam'mano (2007), and Mulwafu et al (2002), offer insights on policy changes, the management of hand pumps and boreholes, water demand management, decentralisation in the water sector, reform of water institutions, and water and sanitation for all. These studies question the effectiveness of the AfDB's water and sanitation projects in increasing access to the rural poor and conclude that water and sanitation governance systems such as the IWRM and community management have not succeeded in eradicating water and sanitation poverty in rural areas.

The AfDB's Operations Evaluation Department official, Gennet Yirga-Hall, admits that projects such as the Mpira Balaka Water Scheme in Malawi was not undertaken as part of

an integrated policy, and did not meet the basic needs of the urban poor, informal settlements and the rural poor; IWRM was absent and the projects were implemented piecemeal; the absence of participatory planning led to high failure rate; there was a lack of suitable performance indicators and supporting baseline data; and the water supply projects did not consider sanitation, had inadequate project planning, poor feasibility studies, and were coupled by inadequate supervision in the 1990s (Clement, Soussan and Mitchell, 2000:9-10). All of the above confirms the shift in focus since the introduction of IWRM, even in projects that were not conceived according to this governance model.

The WSS Projects funded after 2000 when IWRM policy was adopted have the following characteristics:

The strict application of logical frameworks is now enforced and more resources are available for supervision with an appropriate skills mix. The Bank's current and future interventions in the water supply and sanitation sector are now guided by its new policy for IWRM, which, among others, fosters demand-driven approaches and community participation particularly in rural areas, from the conceptual stage to the management and operation of the schemes. Regional Member Countries (RMCs) must be assisted in their efforts to decentralise service provision, and switch from supply-driven to a demand-responsive approaches. Private sector participation in particular must be accelerated by the Bank and RMCs, a process that can be assisted by unbundling WSS services so as to enable phased entry of the private sector. Cost recovery must be achieved to guarantee continued service delivery, with prices sensitive to low income users. Lifeline tariffs, regulation of small private vendor resale prices, and an incremental introduction of full-cost pricing to sensitive communities are required (Yirga- Hall, 2000).

As much as there are various sources for financing water supply such as tariffs, subsidies, and other financial support mechanisms, there is an over-emphasis on the appropriate tariffs in the AfDB's IWRM policy aimed at sending appropriate price signals to users about the relationship between water use and water scarcity. The AfDB is critical of setting low tariffs because they believe that low tariffs do not benefit the poor and that

“free water” provided in some states encourages wastefulness and negatively affects willingness to pay. In the AfDB funded WSS projects the choice between fixed charge tariffs, constant volumetric tariffs, increasing block tariffs, decreasing block tariffs, output based tariffs and seasonal and zonal tariffs, are encouraged to reduce water scarcity.

Table 4.1 Water scarcity and stress in Africa

expected water scarcity by 2025	expected to be water stressed by 2025
<ul style="list-style-type: none"> ▪ South Africa ▪ Malawi ▪ Comoros Island ▪ Rwanda ▪ Burundi ▪ Somalia ▪ Ethiopia ▪ Djibouti ▪ Egypt ▪ Libya ▪ Algeria ▪ Morocco ▪ Cape Verde 	<ul style="list-style-type: none"> ▪ Lesotho ▪ Swaziland ▪ Zimbabwe ▪ Mozambique ▪ Mauritius ▪ Tanzania ▪ Uganda ▪ Eritrea ▪ Nigeria ▪ Niger ▪ Togo ▪ Ghana ▪ Burkina Faso

Direct, cross, and output-based subsidies are discouraged in bank funded projects, except in assisting the poor with first-time connections. The reason is that the poorest are not part of the networks and that many benefits accrue to wealthier consumers (Cardone and Fonseca, 2003, Clement, Soussan and Mitchell, 2000). The justification for the choice of tariffs against subsidies is based on water scarcity (Mwangi, 2008:7). Table 4.1 highlights countries that will experience water scarcity and stress by 2025.

The new trend brought about by IWRM is a shift away from including sanitation, health and hygiene in projects. The following studies indicate that sanitation, health, hygiene and environmental protection are ignored as Yirga-Hall (2000) indicates in an analysis of pre- and post-IWRM implementation eras. Two studies by Fuentes, Pfutze and Seick, 2006a, and Feuntes, Pfutze and Seick, 2006b attempt to detect general patterns in how low access to clean water and sanitation facilities affects the risk of mortality, as well as

the link between lack of sanitation and waterborne diseases. Fuentes et al researched the links in five countries, namely Cameroon, Egypt, Peru, Uganda, and Vietnam between the lack of water and sanitation and the high mortality rate of children. Countries in Sub-Saharan Africa display the highest rates of mortality; in Cameroon and Uganda 9.9% and 10.3% of children respectively do not live past their first birthday. In Uganda and Cameroon, 98.1% and 95% of children respectively live in a household without access to toilet facilities. Access to safe water sources seems to be wealth dependent; in Cameroon and Uganda, a quarter of the children have uneducated mothers, and access to an improved toilet reduces the risk of death by around 40% (Feuntes, et al, 2006a:13). In Uganda, improvements in water and sanitation have a significant effect on mortality decline. A safe water source lowers the risk rate by 22% and in rural areas there is a reduction of 23%. In the case of sanitation, the effect of having a pit latrine on the chances of child's survival is rated at 40% for the country as a whole, as well as for the rural areas. Access to safe water is more important in rural than urban areas and access to improved sanitation facilities can increase the chances of survival in cities (Ibid, 2006:18).

According to Feuntes et al (2006b:9), in Benin, Cameroon, Malawi, Morocco, and Vietnam the outbreak of diarrhoea is significantly reduced if the source of water is piped. In Benin, Gabon, Malawi, Namibia, and Zimbabwe the presence of safe water (piped water into households plus covered wells) reduces the risk of diarrhoea by around 20%. In Ethiopia, Ghana, Namibia, and Zimbabwe the evidence points to a reduction in diarrhoea if the household has access to a water source in the dwelling and non-shared sources of water. For water inside, the risk of diarrhoea is reduced by 28%; for non-shared water the reduction is 23%. Only the wealthiest households will have this type of facility and children in households with water are less exposed to children who are already ill and thus less likely to be infected. In Mali and Ghana, access to a flush or pit toilet reduces the risk of diarrhoea by 39% and 18% respectively and a flush toilet would cut the probability of diarrhoea in half. A flush toilet reduces the risk to a greater degree than a pit latrine; the existence of a pit latrine increases the likelihood of diarrhoea. Children whose mothers have no education face a risk more than 80% greater than

children whose mothers have higher education. All of the above are symptoms of a policy shift that supports pit latrines instead of flush toilets.

The effectiveness of AfDB funded projects in terms of reducing disease burden, improving the quality of lives, better managing water resources, generating balanced water and catchment sources, and providing water allocations agreed to at local levels is put under the spotlight as a result of the policy shift. Another symptom of policy shift is allowing the participation of users in tariff formulation, recognising water rights in practice, gender mainstreaming water allocations, promoting the participation of all stakeholders in water decision making, linking access to water and sanitation, and increasing school enrolment by children.

Although a few previous studies linked IWRM with policy and project work on river basins and shared water courses (Hollingworth and Chiramba, 2005), this thesis included studies in Ghana, South Africa, and Malawi which have adopted IWRM policies and in some cases simultaneously recognise water as a human right. The point was to investigate the extent to which water service providers use support from the AfDB to implement IWRM policies and the extent to which the policies and practices benefit the poor. This choice of analysis helped to establish whether water governance and institutional frameworks are critical in order to lessen rural water and sanitation poverty, as opposed to resource flows into the water and sanitation sector. In the next section the focus is on a few case studies to illustrate IWRM implementation in Africa, without overlooking the fact that IWRM challenges are global challenges.

4.2 Malawi's Mpira Balaka Rural Water Supply Project

The case study in Malawi focuses on the Balaka, Ntcheu, and Mangochi areas which are situated in the southern region. The population of Balaka which is peri-urban with sparsely populated rural areas, is estimated at 316 748 with females numbering 165 111 and males numbering 151 637 according to the latest census conducted in 2008 (National Statistical Office, 2008:3). The district office of the Ministry of Water Development and Irrigation is situated in the dusty Balaka Town. The Mpira Water Authority as well as

Southern Regional Water Board offices are located in Balaka Town. As much as 83% of the total Malawi population of 13 066 320 live in rural areas, Balaka accounts for the smallest share of the population because it is the most backward and poverty stricken of the three areas in this study (NSO, 2008:3). Balaka is home to the Nsamala, Kalembo, and Balaka Boma local areas. About 86% of the households in Balaka have access to water and 15% of the households can walk to the nearest water point in less than 30 minutes (NSO, 2009:77).

Mangochi, situated close to Lake Malawi, has 803 602 inhabitants. Females make up the majority of 416 530; males number 387 072. Of the three districts, Mangochi is the most commercially active and accounts for the greater number of households with access to water and sanitation. The national figure of rural households with access to water and sanitation was estimated at 78%, and Mangochi boasts 91% (NSO, 2009:64). Mangochi is made up of a number of areas, namely Mponda, Chimwala, Nankumba, Jalasi, Mbwana Nyambi, Chowe, Katuli, Makanjila and Namabvi, the Lake Malawi National Park, Mangochi Town, and Monkey Bay Urban. Most of these areas are densely populated; Mangochi Town is the only area that is sparsely populated with a population of 39 369 (the figures presented date back to 2008 which is the year in which the latest census was conducted; no census was conducted during either wa Mutherika's second term or Joyce Banda's term). The case study of Malawi in chapter 6 elaborates on the various areas that constitute Mangochi.

Ntcheu is made up of 474 464 inhabitants with a greater number of females (247 897) than males (226 567). The Mpira Dam is situated at Ntcheu and water is distributed from its source in rural areas to urban areas such as Balaka and Ntcheu Boma. The areas that make up the Ntcheu District include Phambala, Mpando, Kwataine, Makwangala, Champiti, Njolomole, Chakhumbira, Goodson Ganya, Masasa, and Ntcheu Boma. Ntcheu Boma is the headquarters of the district headed by a district commissioner. It is sparsely populated with 14 680 inhabitants, compared to Makwangala with 85 173 inhabitants. Across all the areas of Ntcheu, 78% of households have access to water and 17% of them can walk to the nearest water point in less than 30 minutes (NSO, 2009:77). The

hydrological situation in Malawi in terms of water resources, rivers, lakes, policies, and decentralised institutions is covered in greater detail in chapter 6. The following sections deal in greater detail with the water scheme that the AfDB financed in Malawi.

The Mpira Balaka Scheme is one of the projects that the AfDB funded prior to the adoption of IWRM policy in 2000 as a policy condition, as environmental policy in 2004, and as rural development policy in 2005. Since 2012 the project has been in the hands of the Mpira Water Authority which symbolises the devolution of power from the Ministry of Irrigation and Water Development which has managed the project since its inception in 1987. Much has changed since the implementation of this project. The Southern Regional Water Board created by the promulgation of the Water Works Act of 1995 is responsible for the reticulation of water in urban areas, while the Mpira Water Authority is responsible for rural water supply and sanitation (Focus Group Discussion, 2008 and 2012).

The project's sectoral goal is to provide rural communities with clean and safe water in order to reduce by 50% (this was the 1987 goal when the project was implemented) waterborne diseases in the country. The specific objective was to bring safe water within easy access to some 156 000 people living in 1700km² of the rural area of Mpira-Balaka, and to the 8060 inhabitants of the Balaka township. The populations of Balaka, Mangochi, and Ntcheu have increased tremendously since the project projections were made in 1984. With regards to institutional arrangements, the Mpira Balaka scheme has continued to be operated by the Department of Water since the promulgation of the Water Act of 1995. All employees are civil servants and the resources required for operation and maintenance are provided by the Department of Water of the Ministry of Water Development in Lilongwe (AfDB, 1999).

The scheme was supposed to be managed by the Catchment Management Agency as required in terms of the Decentralization Act of 1998 and the water reforms which have taken place in the country since 1994, but by March 2014 no CMAs have been established. The current institutional arrangement is that the scheme was handed over to

the Southern Regional Water Board which has been responsible for the reticulation of water to households since the Department of Irrigation and Water Development devolved its implementation powers to the district and local assemblies, and water boards. The water users have also established water committees, repair teams, and main committees to oversee the operation of the water supply system and to undertake maintenance activities (AfDB, 1999).

Kabbaj (1999:3) notes that women played a significant role in digging trenches and laying pipes during the construction phase of the project. Additionally, as members of the various tap committees, they are involved in the management of operational activities, including community fund raising for repair and maintenance. The health component of the project has been beneficial to women since the reduction of water-borne diseases like dysentery and cholera (particularly among children who are more susceptible to these diseases), translates into reduced stress on them as well as giving them more time to engage in other activities.

According to the AfDB (1999), the non-payment by the rural beneficiaries of the project poses a serious threat to its sustainability. The AfDB identified the problems (that were encountered in sustaining the scheme), as the provision of free water, and central control of the water scheme by the Ministry of Water Development. However, the lack of capacity within the decentralised institutions such as the Southern Regional Water Board and the Balaka District Assembly, are ignored. The main argument of the AfDB is that large investments in a rural setting without the application of cost-recovery is likely to run into operational and maintenance problems. The AfDB fails to reflect on the abuse of the constituency system by MPs, the lack of capacity within the DIWD and the Balaka District Assembly, as well as the poor implementation of IWRM at all levels. IWRM is not a solution if it is a 'cut and paste' model without considering local conditions of poverty, affordability, skills base, political will, and customisation to local conditions.

4.3 Ghana's Sanitation Improvement Project

The case study in Ghana focuses on the Greater Accra Metropolitan Area. The city of Accra in the capital city of Ghana was initially called the Accra Metropolitan Area, and since 2001 the city has sprawled beyond its former boundaries. Today, the city covers an area generally referred to as the Greater Accra Metropolitan Area (GAMA), consisting of the Accra Metropolitan Area (AMA), the Ledzekuku-Krowor Municipal Area, the Tema Metropolitan Area (TMA), the Ashaiman Municipal Area, the Adenta Municipal Area, the Ga East Municipal Area, the Ga West Municipal Area, and the Ga South Municipal Area (Adank, Darteh, Moriarty, Osei-Tutu, Assan and van Rooijen, 2011: iii).

In the year 2000 the population stood at 2.7 million inhabitants. Taking into consideration different growth rate scenarios, the 2007 population of the Greater Accra Metropolitan Area (GAMA) can be estimated to have been between 3.4 and 3.9 million people. Considering different growth scenarios, estimates for the 2030 population of GAMA would range somewhere between 7.3 million and 16.3 million people. Infrastructural development within the city has to a large extent taken place in an unplanned way. In Accra, different types of socio-economic zones can be identified. High density indigenous areas are mainly located along the coast, while high density lower class areas are more scattered over the Greater Accra Metropolitan area. Mid-density indigenous areas can be found mainly in the older residential areas in the AMA area, and middle density areas in central Accra and the Ga and TMA areas. Low density high class areas are mainly found in eastern AMA, but also in some Ga and TMA areas. Rural fringes can be found on the outskirts of Accra, and in all areas except the Accra Metropolitan Area. The majority of the population (54%) of GAMA lives in compound houses and many households rent (46%) rather than own the houses they live in (Adank, et. al, 2011:10).

The Accra integrated urban water management vision for 2030 promises:

There will be 100% access to uninterrupted water supply at an affordable price within a reasonable distance from the house; water quality will meet Ghana Standard Board criteria; non revenue water due to physical and commercial losses in the GWCL system will amount to 20-25%. There will be improved productive uses of

water for livelihoods such as micro enterprises and agriculture; about 80% of Accra's citizens will practice good sanitation behaviours and willingly pay for waste management. This will have led to a 70% reduction in water and sanitation diseases. At least 80% of Accra's citizens will have access to an acceptable level of sanitation facilities, including flush toilets, Kumasi Ventilated Improved Pit (KVIP) latrines or good public toilets. Pan and bucket latrines will be phased out. There will be no more open defecation and littering; hand washing after toilet use will be common practice; integrated solid waste management in the form of collection, transport, treatment and final disposal of solid waste in a sustainable way will be achieved. Collection of solid waste will be 90% and Accra will separate its solid waste; Accra will be a cleaner city with good drainage systems (Adank, et. al, 2011:11).

The case study of Ghana focuses on the rehabilitation of sanitation infrastructures which suggests an IWRM shift from integrated management of both water supply and sanitation to exclusive sanitation management by a separate state institution. The following section reflects on the sanitation situation in Accra prior to the introduction of IWRM.

4.3.1 Excreta and wastewater services

Different sanitation service delivery models can be identified in the Greater Accra Metropolitan. Sanitation service providers can be broadly grouped into three categories: municipal service providers, private service providers, and self-supply. The municipal providers include septic emptiers which service both private water closets (WCs) and public facilities, a sewer system with household and institutional-connected WCs, and human waste transfer stations where human waste from pans and bucket latrines is collected. There are also private sector septic emptiers which service the same target group as the municipal septic emptiers. Finally, a number of people and institutions provide sanitation services. These include institutional sewer systems and on-site treatment sanitation facilities like pit latrines and KVIPs.

The main challenges related to sanitation in Accra were summarised by the Accra Learning Alliance (an NGO active in the water and sanitation sector):

“The vast majority of the waste treatment plants are not working. The two central sewer systems are not operational and of the 35 institutional treatment plants, only four are functioning. Most wastewater is disposed of in soak-away storm drains and by throwing it into the street or compound. Part of this water infiltrates and joins the groundwater resources and part flows to the sea through the storm drainage system. Most of this flows untreated into the ocean. There is a lack of treatment capacity. Even if fully functional the capacity for liquid waste treatment is far below the estimated wastewater production. “Only about 17% of the estimated amount of wastewater is produced. As more water is supplied to the city, the production of wastewater will rise as well, increasing the need for safe collection, treatment and disposal of wastewater. The lack of safe and hygienic sanitation facilities is also noticeable. Although according to official statistics the percentage of people who practice open defecation or use unhygienic bucket or pan latrines is very low and estimated to be 4.3%, the presence of rubber bags containing human excreta, especially in the densely populated areas, seems to suggest that there still is a problem in this area. An important reason for people not using hygienic sanitation facilities is the fact that these facilities are not available in the house, because of lack of space, lack of willingness of landlords to provide sanitation facilities and lack of awareness and urgency. Public facilities are not often used because these are too far away, too filthy and too time-consuming to use, because of long queues. Many people depend on public sanitation facilities, paying more for access to lower level services than people with access to private sanitation services.”

Even access to adequate sanitation facilities remain a challenge despite the AfDB’s focus on the rehabilitation of existing sanitation infrastructures:

“Low income households generally do not have the space and resources to install a septic tank or KVIP. The level of sanitation services provided by the public latrines service varies but is generally low. The number of public latrines is too small to serve the estimated 1.5 million people depending on these facilities, leading to long

queues during the early morning and evening rush hours. The abolishment of pan and bucket latrines was expected to increase the pressure on the public latrines. In addition to the problem of long queues to access the facilities, the sanitary condition of public toilets is generally poor. As with water supply, people connected to the central system pay less than people who are not connected. However, the number of people connected to the sewer system is extremely small.”

To overcome these challenges, the Accra Learning Alliance explored the following strategic directions:

“...improving access to private sanitation facilities which can be achieved through the enforcement of by-laws for the construction of household latrines combined with the facilitation of appropriate technology choice and awareness creation and education. Another proposal was to improve public latrine services, by increasing the number of public latrines, ensuring adequate water supply to public latrines and improving the management of public latrines. It was also felt that increasing the treatment capacity is imperative. Under the Accra sewerage improvement project, there are plans to extend the sewer system. However, even when fully successful, the impact of this intervention was expected to be relatively small. Therefore, additional strategies were needed like securing, acquiring and maintaining sludge treatment sites, rehabilitating existing ones and using natural systems. Other key point was improving the use of existing treatment capacity, by increasing the number of connections to the sewer system and by building the capacity of the sewerage unit staff.” (Accra Learning Alliance)

The number of households with access to sanitation in Accra and Ghana is generally very low. About 15% of the Accra metropolis, mainly in the central area, is served by a piped waterborne sewerage network. The remaining areas are served by on-site sanitation facilities in the form of septic tanks and improved pit latrines. The sewerage network has seen very little extension since its construction in the early 1970s. There are several individual sewerage systems in the metropolitan area, constructed and operated by

different organisations. At present none of these systems are operational. The effect of neglect and poor maintenance of the sanitation and sewerage systems in Accra has resulted in an increase in the pollution of surface water bodies in the metropolis (ADF, 2005:1).

In 2005, about 58% of the urban and 29% of the rural population had access to household sanitation facilities, mostly ventilated improved pit (VIPs) latrines, and septic tanks. Waterborne sewerage networks exist in major urban centres such as Accra, Tema, Kumasi, Takoradi, Akosombo, and Obuasi. Most of these systems are in a state of disrepair. The remaining urban population has access to pan latrines and public toilet facilities. While the major urban centres in the south of the country have engaged the services of private companies to improve on waste or septage collection capacity thereby increased service coverage, most other urban centres directly operate their own fleets of vehicles (cesspit emptiers) to provide collection services. Most of the waste or septage collected is disposed of untreated. Collection is done by means of cesspit emptiers. Disposal methods are mainly trenching and eventual burial and -or open discharges in the environment. In some major urban centres, treatment facilities have been provided to treat collected septage before disposal.

Poor environmental sanitation continues to be a major drain on the country's weak economy through high health expenditure and loss of productivity due to illness. Environmentally-related diseases, though preventable, are the main causes of ill-health and therefore the most frequently reported in health centres. Malaria accounts for about 41% of all outpatient attendance. Other major causes of morbidity include diseases such as diarrhoea, skin and eye diseases, cholera, typhoid, and intestinal worms which together account for 16% of outpatient attendance. Upper respiratory tract infections account for 8%, all of which are attributable to poor environmental conditions (ADF, 2005:4).

With regards to institutional arrangements the metropolitan and municipal assemblies are responsible for solid and liquid waste collection and disposal as well as rainwater drainage systems. Rural water and sanitation responsibility is devolved to the district

assemblies. In addition, a Community Water Supply and Sanitation Agency (CWSA), formerly the Community Water and Sanitation Division of the Ghana Water and Sanitation Company, was established in 1998 to facilitate the provision of water supply and sanitation services by the district assemblies to rural communities. The rural water and sanitation sector policy is guided by the government's overall decentralisation policy which seeks to transfer authority, responsibility, and capacity from central government, sector ministries, and departments to district assemblies by promoting grassroots participation in the administration and management of the provision of infrastructures (ADF, 2005:5).

In 1999, the MLGDR in collaboration with key sector institutions, prepared and launched the Environmental Sanitation Policy document to guide sector operations and to optimise the use of available national resources by defining a systematic approach and framework for resource allocation and sector development. The policy requires that by the year 2020, the following main targets should have been achieved: (i) at least 90% of the population has access to an acceptable domestic toilet and the remaining 10% has access to hygienic public toilets; (ii) hygienic public toilets are provided for the transient population in all areas of intense public activity; and (iii) all pan latrines are phased out by 2010.

With regards to sanitation charges, each household is charged a flat yearly sewerage tariff of 60,000 cedis which had not been reviewed since 2000. Over the years, billing and collection of sewerage tariffs/charges have been handled by the Ghana Water Company Limited (GWCL). Sewerage charge was a major component of the overall water tariff in Ghana under the regulatory jurisdiction of the Public Utilities Regulatory Commission (PURC). As part of the gazetted water tariff, a 35% sewerage surcharge on volume of water consumed in houses with sewer connections, was paid by consumers to the GWCL. After the sewerage function of the GWCL was ceded to the AMA, the Ghana Water Company continued to bill and collect the 35% sewerage surcharges on a commission basis, to be transferred to AMA's dedicated account which is used for financing the recurrent expenditures of the sewerage system. Payments are made by various categories of consumers, notably domestic, commercial, industrial, and public institutions, either

directly at the offices of the GWCL or through licensed private revenue collectors (ADF, 2005:11).

Most public toilet facilities are managed by unit committees and area councils. The daily average number of visits is about 1500. User fees are collected by attendants prior to use of the facilities. The fees are: 400 cedis per visit for Kumasi ventilated improved pit latrines (KVIP), 600 cedis per visit for aqua privies, and 1,000 cedis per visit for water closets. The private sector participates in the collection of liquid waste under a franchised arrangement. Tipping fees are charged by the AMA/WMD. Service charges for septage collection and haulage by cesspit, average about 450,000 Cedis per 5m² truck load. Payment of service charges is made prior to provision of the services (ADF: 2005:11).

The immediate beneficiaries are the urban and peri-urban populations in Accra which number about 1,467,839 (49.5% of the 2020 Accra population), the majority of whom are poor. The remaining population including women in Accra were expected to benefit from the public toilets and sanitation education programmes. The other beneficiaries were the AMA/ MLGDRD through the provision of institutional support and capacity building and consultants/contractors who were involved in project implementation (ADF, 2005:18).

4.4 Conclusion

The implementation of IWRM in Ghana, Malawi and South Africa contributed to water and sanitation poverty and scarcity, as indicated in chapters 5, 6 and 7. The criticisms of IWRM in Zambia, Lesotho, Ghana, and Malawi illustrate the concerns raised in case studies in different parts of the world. Specifically, IWRM is forcing decentralisation and private sector participation upon developing countries, while the separation of rural water and sanitation management promotes scarcity in rural areas in general and in Africa in particular. Most countries which embarked on decentralisation a decade and a half ago and are still grappling with capacity building in local authorities which are charged with the responsibility to manage waste water treatment plants, increase the provision of services, and implement IWRM. The implementation advice on community management, namely increasing tariffs in order to benefit the rural poor, has proved to be counter-

productive in various parts of Africa. The next chapters present the findings on IWRM implementation in each of the case countries (Ghana, Malawi, and South Africa) and explore the footprints of IWRM in Africa presented in this chapter.

Chapter Five

Ghana's water decentralisation, drought and cost recovery

5.1 Introduction

This chapter elaborates on and examines water and sanitation governance, new institutional economics, and environmental economics regarding the implementation of IWRM in Ghana. Examples of collective action with respect to water and sanitation, irrigation and dam establishment, institutional arrangements and mechanisms, property rights, and decentralisation and market mechanisms will be provided. Various examples of transaction costs, institutional evolution, constitutional choice, information costs, institutional transaction costs, eco-efficiency, environmental performance and sustainability, physical and economic scarcity, and externalities are used to illustrate the water and sanitation governance systems of Ghana in the implementation of IWRM in water resources management and water and sanitation supply. This chapter will elucidate how decentralisation, cost recovery, privatisation and neo-liberal implementation of IWRM by the Water Resources Commission, the Community Water Supply and Sanitation Agency, the Ghana Water Company Limited, and other institutions have resulted in the establishment of a water vending market in Ghana (Fuest, 2005:5, Laube, 2007:419).

In responding to the interview questions, 25 participants who are beneficiaries of the Accra Sanitation Rehabilitation project shared their experiences on water and sanitation governance in various focus group discussions that took place in the Densu Delta water resource management areas, and the predominant themes were: recovery, lack of subsidisation on poor households, privatisation of water in urban areas, and the role of community management in rural areas (Laube, 2007:420). According to Birner, Schiffer, Asante, Gyasi and McCarthy (2005:1), the last decade has seen a shift towards demand-oriented approaches and towards involving communities, NGOs, and private sector financing, to provide and manage infrastructures for drinking water and sanitation, irrigation, and livestock water supply. This view was confirmed in the field during various focus group discussions and shared by Laube (2007:420) and Fuest (2005:5). The

functioning of water and sanitation institutions in the various water management areas, institutional frameworks, and environmental management is one of the themes which emerged in the field. In this chapter the outcomes of IWRM implementation in Ghana in general and the Greater Accra Municipal Council in particular, is dealt with. The research area fits the category of peri-urban area as defined by Simon, McGregor, and Nsiah-Gyabaah (2004:239) in terms of pollution risks, being an extension of the city with strong agricultural production, being 30 to 40 kilometres beyond the urban edge, and the village way of life which makes it a rural area in the Ghanaian context. In the rural context, IWRM implementation and the governance of water resources is complicated because it has to address environmental and economic interactions which affect water availability and quality, households claims for increased focus on the domestic water cycle within socially and culturally changing power relations, climate change adaptation, and population pressure. The institutions that participate in the IWRM platform reflect differences in power relations (Birner et al, 2005:6, Laube, 2007:421).

5.2 Water and sanitation governance

In the Greater Accra Metropolitan Area there are both formal (meso) and informal (micro) water and sanitation governance arrangements. District, social and sub-councils, ministries such as Food and Agriculture, Public Works and Housing, Health, Fisheries, and the Community Water and Sanitation Agency (the Community Water and Sanitation Act 564 of 1998 was passed to pave a way for the establishment of CWSA), the Environmental Protection Agency, the Volta River Basin Authority, the Water Resources Commission, and the Ghana Water Company Limited are some of the formal institutions in Ghana whose roles, powers, and functions are defined in various acts and policies (Fuest, 2005:16). The eight metropolitan and municipal areas that constitute the Greater Accra Metropolitan Area are managed by assemblies. The metropolitan and municipal assemblies derive their mandates from the Local Government Act of 1993 (Act 462). The structure of these assemblies is spelt out in the Act. By this Act, the assemblies are the highest political authorities mandated to govern municipalities or metropolitan areas, and to provide basic infrastructures and services to support social and economic development of the areas. The areas under the assemblies are sub-divided into sub-metros which in

turn are further divided into towns or area councils and unit committees (Fuest, 2005:16, Adank, et al, 2011:5). In Ghana the country's water resources are now officially under the control of the Water Resources Commission which propagates IWRM and has the task of managing the country's water resources efficiently, sustainably, and equitable. This chapter reflects on the failures of the WRC to influence water sector decisions which gave rise to water vending, full scale privatisation and commercialisation of state institutions, and the marginalisation of rural communities (Laube, 2007:419). In promoting the implementation of IWRM, and the privatisation and commercialisation of water resource management, the Ghana government enacted a new water law, the Water Resources Commission Act, Act 522 of 1996 under considerable donor-pressure to privatise the urban water supply and leave the management of rural water to communities (Ghana Government, 1996: VII-4002, Laube, 2007:419, Opoku-Agyemang, 2005:271).

The implementation of IWRM in Ghana began four years before the African Development Bank even approved IWRM as a policy condition for funding water and sanitation infrastructures in Africa. It was expected that the implementation of IWRM would proceed without difficulties as Ghana was leading the process, but results in the field proved otherwise because informal and formal constraints became the order of the day. The implementation of IWRM in Ghana tends to neglect the local context in implementation challenges (Birner et al, 2005:13, Laube, 2007:421). The following associations are informal and their roles, powers, and functions are not written into policies and legislations, but they play meaningful roles in community water management, irrigation land allocation, and demand management: tindanas (spiritual leaders), stools, traditional leaders (National, Local and Regional Houses), water and sanitation committees, and water user associations (WUAs) (Opoku-Agyemang, 2005:271, Fuest, 2005:8).

The contradictions in IWRM implementation in Ghana and in the Greater Accra City Metropolitan Council feature prominently in community management, ownership, private sector participation, cost recovery related water and sanitation tariffs, and the sustainability of facilities by beneficiary capital cost contributions and the concept of

water as an economic good (Fuest, 2005:5, Laube, 2007:420). All responsibilities that were devolved to micro and meso levels were done without responsibility or adequate funding, with government departments at all levels being moved away from implementation roles to becoming facilitators and regulators (Fuest, 2005:5). In the devolution of water resource management, existing water and sanitation rights were abolished and a basis for the allocation and taxation of water use rights was created. Laube (2007:421) argues that the local states in Ghana and West Africa are premised on incomplete decentralisation and democratisation.

The role of spiritual leaders, traditional leaders, WUAs, and other community management institutions that were co-opted into market-orientated institutional arrangements in which water is sold along commercial lines, is complicated. The task of the water and sanitation commercialisation that was not performed by the Community Water and Sanitation Agency before devolution to rural households, was now expected to be performed by rural communities. According to Opoku-Agyemang (2005:271), before the promulgation of the Water Resources Act of 1996, natural waters were managed as an appurtenance of land and therefore whoever owned a portion of land could automatically exercise certain rights over the water contiguous to the land. This arrangement changed when the Water Resources Commission became responsible for national water licencing and assemblies took over that responsibility at the local level. The assemblies, according to Laube (2007:421), resemble political patronage; un-holy alliances between local administrators and politicians and local powerful interest groups that participate in water and sanitation governance for accumulative purposes. These predators include both spiritual and traditional leaders co-opted to accumulate wealth at the expense of the poor (Fuest, 2005:8, Odame-Ababio, 2002:157, Birner, Schiffer, Asante, Gyasi and McCarthy, 2005:1, Laube, 2007:419, Opoku-Agyemang, 2005:271).

5.3 Meso and micro institutions in Accra and Ghana

Water resource management dates back to the early 1900s when the Rivers Ordinance (CAP) 226 of 1903 was passed. Section 10 of this ordinance forbids pumping or diverting the flow of rivers for irrigation, mining, power generation, and industrial supply without a

licence granted by the minister (Odame-Ababio, 2002:159). The water resource developments that took place prior to independence were indirectly guided by such ordinances although no regulations were put forward to support the enforcement. In 1928, the first piped water supply system was constructed at Cape Coast. In 1944 a Department of Rural Water Supply was set up by the British Colonial Administration (Fuest, 2005:9). Since independence the priority of the government has been to establish agencies and institutions with specific roles in water supply, irrigation, and environmental management. The Water Supply Division of the Public Works Department was responsible for the service provision in rural and urban areas of Ghana. After Ghana's independence in 1957, the division was separated from the Public Works Department and placed under the Ministry of Works and Housing. The Ghana Water and Sewerage Corporation (GWSC) was established as a result of the promulgation of Act 310 of 1965. In 1965 it was transformed into the Ghana Water and Sewerage Corporation (GWSC), a legal public utility responsible for the provision of urban and rural water supply for public, domestic, and industrial purposes as well as the establishment, operation, and control of sewerage systems (Odame- Ababio, 2002:160, Birner, 2005:19 Fuest, 2005:9).

Various water resource management institutions have been created since independence. The Institute of Aquatic Biology and the Water Resources Research Institute were created in the Ministry of Environment, Science and Technology with the promulgation of the NLCD 293 of 1969. The Meteorological Services Department and the Hydrological Services Division were also created within the Ministries of Communications and Works and Housing respectively. The promulgation of SMCD 85 of 1977 saw the creation of the Irrigation Development Authority in the Ministry of Agriculture. The Volta River Authority in the Ministry of Mines and Energy was established as a result of the promulgation of Act 46 of 1961. In 1970 the Volta Lake Transport Company was registered under the Company Code of 1970 as a state company in the Ministry of Transport and Communication. In 1974 the Forestry Commission was created in the Ministry of Land and Forestry as a result of the promulgation of Act 490 of 1974 (Odame-Ababio, 2002:160). All of the above institutions were sector specific with each sector managing, controlling, and regulating its own activities, and there was no IWRM

platform that the various sectors working within water resource management could use to negotiate water allocations (Odame-Ababio, 2002:160). Since 1993, various reforms have been introduced to address the problems of the sector. The key objectives of the reforms were to separate rural and urban service, to introduce independent regulatory agencies, and to promote private sector participation (CWSA, 2004:7, Fuest, 2005:11, Laube, 2007:422).

In order to pay more attention to water supply and sanitation in rural areas, the Community Water and Sanitation Division was founded as a semi-autonomous division of GWSC in 1994. Four years later, it changed its name to the Community Water and Sanitation Agency (CWSA) and became fully independent. The establishment of CWSA was part of the Structural Adjustment Programmes of the World Bank Group and the IMF loan conditions of transferring small water systems and sewerage systems to district assemblies. The CWSA was charged with the responsibility of regulating rural water and sanitation schemes and with facilitating the community management of such schemes (Fuest, 2005:16, Water Resources and Environmental Sanitation Project, 2008, Eguavoen, 2008:163). Ghana adopted the National Community Water and Sanitation Programme in 1998 as a strategy to decentralise rural water and sanitation management to local communities. Local communities were then expected to deal with the technical aspects of maintaining boreholes and hand-dug wells excluding those who were unable to pay, and changing communal water and sanitation management into commercialised and market-orientated water and sanitation demand-management models. In rural areas the CWSA was established with the mandate to act as a facilitator for the delivery of water and sanitation facilities and hygienic sanitation facilities in a congenial environment (Odame-Ababio, 2002:161, Fuest, 2005:11, Eguavoen, 2008:161).

In 1999, the GWSC was replaced by the publicly-owned GWCL. At the same time, the responsibility for rural water supply and sanitation was decentralised to the district assemblies and regulated by the CWSA (Fuest, 2005:11). In addition, sanitation was separated from water supply and became the responsibility of the district assemblies in urban and rural areas. As a result, the GWCL remained responsible only for urban water

supply, whereas the water systems of over 110 small towns were transferred to district assemblies which received support from the CWSA (Fuest, 2005:16). The key focus of the GWCL was to facilitate partnerships with the private sector in urban water supply. In terms of sanitation, district assemblies are responsible for urban and rural areas. In the latter case, a demand-driven and community-managed approach was introduced. As indicated above, the CWSA remained a facilitator of community-management and ownership of water supply, sanitation facilities-creation, operation and maintenance, and hygiene promotion (Water Aid, 2006:2, UN, 2004:2, Odame-Ababio, 2002:161 CWSA, 2004:7).

The regulation of water supply had been shifted from the government to independent agencies. Two commissions were created in 1996 /1997 and 1998 including institutions to regulate the sector namely Public Utilities Regulatory Commission (PURC), the Water Resources Commission (although the WRC act was passed in 1996, operationalisation only began in 1998), and the Environmental Protection Agency (EPA) (CWSA, 2004:9, Fuest, 2005:11). PURC has been developed to formulate and approve appropriate pricing mechanisms aimed at full-cost recovery since the government began to phase out the subsidisation of water services in 2003 (African Economic Outlook, 2007:294). The PURC has no authority over community-managed water systems and only regulates GWCL services. Besides the provision of tariff guidelines and the examination and approval of tariffs, it protects the interests of consumers and providers, promotes fair competition, and initiates, conducts, and monitors standards concerning the provided service. The rural participants of this study did not have any direct experience working with PURC since it regulates GWCL and not CWSA (Focus Group Discussions, 2010, van Edig, et al, 2007:35).

Whereas the PURC takes responsibility for economic regulation of urban water supply and sanitation, the Water Resources Commission (WRC) regulates water resources; it is in charge of licensing water abstraction and wastewater discharges. There are instances where cooperation between WRC and PURC is not visible hence van Edig et al (2007:34) concluded that there is a need to improve cooperation between the two regulatory

institutions. The purpose of IWRM is integration amongst water and sanitation institutions, but results on the ground appear to indicate that the opposite has occurred since the various structures contradict each other and integration and cooperation is not visible at all (Fuest, 2005:65, Focus Group Discussion, 2010). The Ministry of Works and Housing established a Water Directorate to coordinate policies effectively and monitor donor support in the water sector, but lack of cooperation in the sector has persisted (Water Aid, 2006:5, van Edig, et al, 2007:35, Odame-Ababio, 2002:161).

To carry out private sector participation of GWCL a 10-year lease contract was originally envisaged. In 2000, a lease contract between GWCL and the USA company, known as Azurix, failed due to public opposition and accusations of corruption which led to the formation of the Coalition Against Water Privatisation (Rahaman, Everett and Neu, 2007:670). In October 2006, under the auspices of the Urban Water Project, a five-year management contract was signed between the GWCL and AVRL. The main objectives of this private sector participation are:

....extending reliable water supply, especially to low-income areas, making potable water affordable for low-income consumers, increasing cost recovery, ensuring investments based on low-cost and concession financing, supporting further involvement of the private sector, reducing non-revenue water and increasing water treatment (ISODEC, 2009).

The project was financed by the World Bank, the Nordic Development Fund, and the Republic of Ghana (Doe, 2007:36). In 2005 the African Development Bank funded the rehabilitation of sanitation infrastructures in Accra (ADF, 2006:20). In March 2008 severe water shortages in Accra were reported, leading Boniface Abubakar Saddique, the then Minister for Water Resources, Works and Housing, to review whether the AVRL was working in compliance with the management contract. However, he explained that the reason for the shortages was unforeseen power outages at two water treatment plants in Weija and Kpon and stated that the overall situation was expected to improve noticeably by the end of 2008 due to the installation of several new boreholes and a more stable

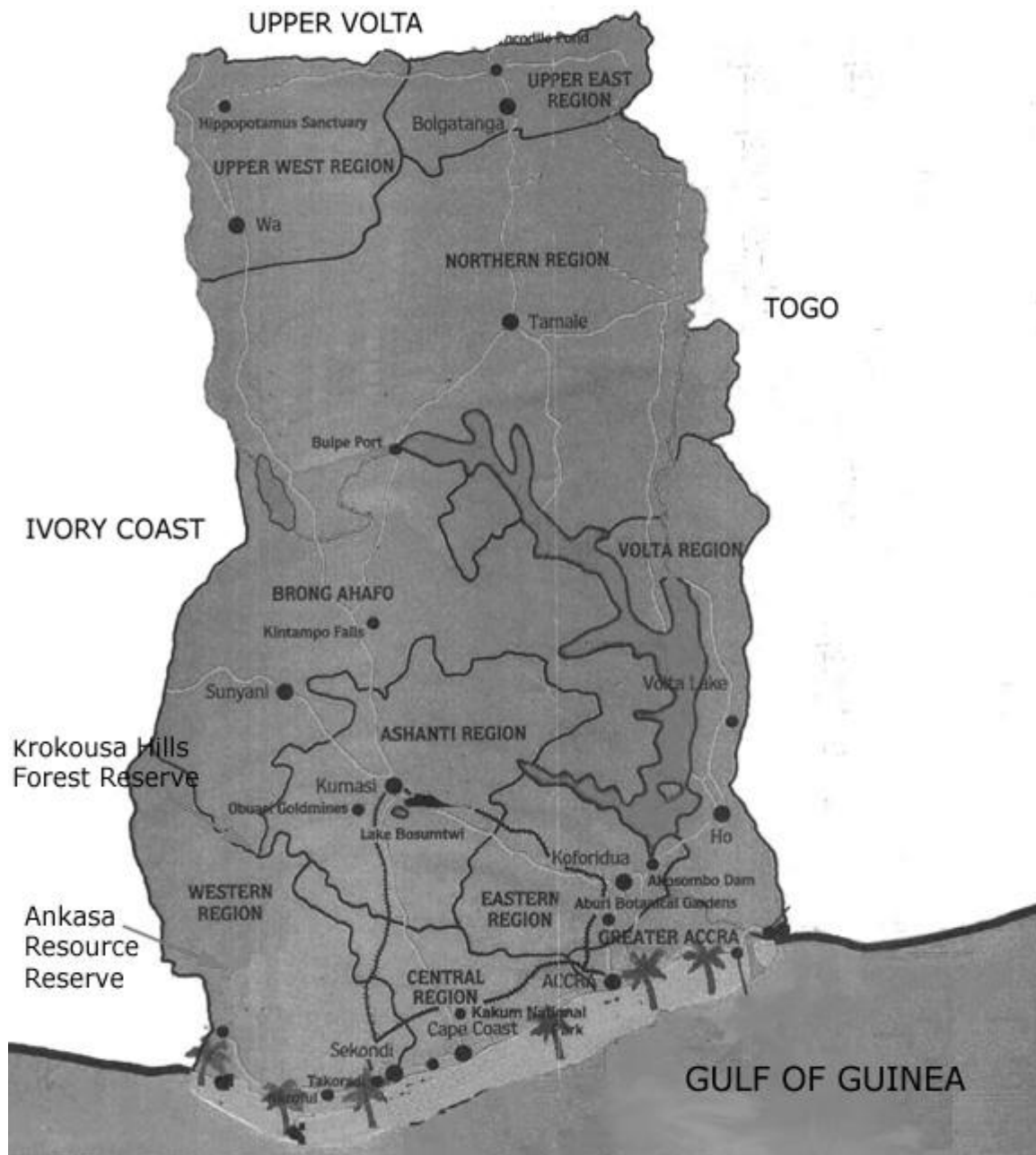
power supply. This situation has however still not showed any improvement. The shortage of water in Accra is confirmed in the field as being unrelated to the availability of water but rather owing to economic issues related to power supply, privatisation, and the commercialisation and community management of schemes. Each time there are power supply problems water becomes inaccessible. The water supply scarcity that led to water vending is not related to lack of precipitation, rain and river sources, but rather to poor governance associated with IWRM implementation. The scarcity of water resources is associated with the type of water management institutions created to support IWRM implementation (Focus Group Discussion, 2010, Benson, 2008).

5.4 Water resource management institutions

Water resource management institutions in Ghana are classified as international, national, regional, and local. They are also classified according to sector which is either public, private, or third sector. Water resource management and institutions are further classified according to priorities which are either developmental (economic and social) or environmental (Birner, et. al, 2005:13). The government agencies involved in water resource management operate from the standpoint of the decentralisation and IWRM perspectives. The Ghana Water Company LTD, district assemblies, WUAs, WATSAN, and the CWSA, are decentralised institutions that manage water and sanitation services. The government institutions which are regarded as water users are IDA, GWCL, CWSA, VRA, VLTC, and MC. The institutions responsible for water resource planning input provision are HSD, WRI, and MSD. The regulatory agencies that play an important role in IWRM are EPA, FC, and MC. The civil society organisations that play an important part in IWRM are NGOs (CONIWAS, CAWP, and ISODEC), women organisations, and chiefs (Odame-Ababio, 2002:163). Private providers such as vendors, kiosks, and community management schemes using demand-led price-elastic models, are also a form of decentralisation. Decentralised institutions lack revenue to discharge their responsibilities properly.

The section below provides the local government context of Ghana (Birner, et al, 2005). The map covers various districts, municipalities, regions, and sub-regions that have been introduced since the Local Government Act of 1993 (Act 462) (Adank, et al, 2011:5).

Figure 5.1: The ten regions of Ghana



Source: <http://www.virtualexplorers.org/ghana/map.htm> accessed 29 September 2011

5.4.1 District assemblies

The Ghana public administration system consists of 39 ministries, departments and agencies; 170 sub-vented agencies; five statutory funds; 34 state-owned enterprises; 10 regional coordinating councils; 138 district assemblies; 1306 zonal/urban/town/area councils, and 15,386 unit committees. The decentralised government system consists of regions which are governed by regional coordinating units, and districts which are governed by district, municipal or metropolitan assemblies, depending on their size. The urban, zonal, town or area councils constitute sub-districts. Unit committees are at the lowest government level. As a result of the decentralisation process in Ghana, development planning is devolved and decision-making authority rests in the hands of the metropolitan, municipal and district assemblies which were established by the Local Government Act of 1993 (Act 462) with the prime aim to empower people to participate in the development process and to have access to decentralised services. The Regional Coordinating Council has a coordinating and facilitating role, but no planning authority of its own. These institutions are dominated by party political patronage. The ruling party appointed its own members in crucial positions in district assemblies. Members of parliament (MPs) use assemblies as platforms to launch their campaigns by donating boreholes and other water points in exchange for votes. Party membership in local and district assemblies also determines who gets access to available resources (Birner, et. al, 2005: 14, Fuest, 2005: 17, Focus Group Discussion, 2010).

The district assemblies are both the legislative and the administrative branches at district level. The general assembly, consisting of elected and appointed members, constitutes the legislative branch of local government at the district level. The district chief executive, who is appointed by the president, is the political head of the district. He also chairs the executive committee which comprises several assembly members, but not the presiding member of the general assembly. The general assembly has a number of committees and sub-committees, corresponding to major sectors such as agriculture, health, education, and general affairs such as administration and finance and citizen petitions. The district coordinating director is the administrative head of the district. The appointment of the DCE by the president is another example of political patronage which undermines local

democracy. The DCE tends to report to the president and is a conduit of state house patronage to local party appointees while ignoring local actors (who may be ordinary people) and opposition parties (Birner, et. al, 2005:16, Fuest, 2005:12, Focus Group Discussion, 2010).

The districts have the authority to raise revenues. They are also entitled to transfers of not less than 5% of the total revenues of Ghana. These transfers are administered in the form of the District Assembly Common Fund, which is allocated annually to the districts according to guidelines issued by parliament. In addition, funds are also spent in the districts through programmes and activities of the different ministries and by various donors and NGOs. These funds are separately administered so that the districts do not know the total amount of funding which is available per year, even if the figures are required for district planning documents. For the planning and budgeting process, district assemblies receive guidelines for developing action plans and medium-term plans. The guidelines are issued by the National Development Planning Committee and specify that development priorities should be based on data collected and on local level consultations, in keeping with legal, policy, and administrative requirements. One of the most important activities in the operation of the district assemblies is the procurement of goods, works, and services depending on the development of plans and the availability of funds. The procurement procedures are specified in the Public Procurement Act of 2003 (Act. 663) which outlines the structure, methods, and tendering procedures. These procedures for large capital investments are important to ensure the efficient use of developmental funding. There have been reports of district assembly common funds being used for political rallies and also misused by candidates who contest elections in constituencies to buy votes (Birner, et. al, 2005:17, Fuest, 2005:12, Focus Group Discussion, 2010).

The sub-district government structure is also expected to provide platforms for citizen participation in the planning and priority setting process. This structure focuses mainly on local government tax collection. The major sector ministries in charge of providing public services have been de-concentrated so that considerable authority has been devolved to district level offices. The ministries have also been decentralised, mandating the district

level officers of the line agencies to report to the district administration. The district level sector departments should be fully integrated in the annual planning and budgeting cycle. In practice, officials from line ministries tend to report to their principal secretaries and not to officials and the leadership of the district assemblies. The decentralisation is a requirement on paper, but in practice the national ministries are still in charge of local affairs (Birner, et. al, 2005:17, Fuest, 2005:12, Focus Group Discussion, 2010).

There is no equivalent to WRC and EPA in the districts. As of 2010, the WRC was still exploring ways to institutionalise its functions and how to most appropriately use the decentralised local government structures such as regional and district assemblies (Odame-Ababio, 2002:164). Since district assemblies have the authority for development planning at local level, the decisions on investment for infrastructures required for drinking water in the form of boreholes and for irrigation in the form of small dams and dug-outs, are part of the district development plans. This requires close coordination with the line agencies in charge, such as the CWSA, the Ministry of Food and Agriculture, and funding organisations such as donors and NGOs. Together with line agencies, the district assemblies are in charge of supporting local communities in managing infrastructures for domestic water supply and for irrigation. For domestic water supply, the district administration has formed the water and sanitation teams, usually consisting of three administrative staff members who are in charge of assisting communities in the management of domestic water supply. For example, these teams process the applications of communities for boreholes, and supervise the work of the consultancies contracted to conduct community training. The establishment of water and sanitation teams as part of the general district administration, appears to be the outcome of a donor-supported policy decision to develop this specific capacity as part of the general district administration. This approach fits into the decentralisation policy and into the policy of implementing a demand-driven, community-based rural drinking water supply. In support of decentralisation in the IWRM river basin concept, a Densu Basin Office and a Basin Board was established in 2002 with EPA, DAs, MDAs, NGOs, private sector, consultants, research institutions, farmers, fishers, women, and traditional leaders as key stakeholders. If DAs had a choice, the management of dug-outs, small dams, and

irrigation schemes could have remained with CWSA since it is a mammoth task to perform without funding. (Birner, et. al, 2005:17, Odame-Ababio, 2002:164, Fuest, 2005:12, Focus Group, Discussion, 2010).

The administrative support staff members providing management support for agricultural water supply is located in the district offices of MOFA. MOFA has been the major agency in charge of establishing and rehabilitating small dams, but expects the DAs to provide guidance on important aspects of the management of small reservoirs. The land to be irrigated under small reservoirs is registered in the name of the DAs, making them formal owners of the land. Mediation of conflicts regarding land use related to small dams is also seen as the responsibility of the DAs. This institutional arrangement can result in DAs improving capacity in water resource management since their focus is not only water reticulation but also on the construction, operation, and maintenance of irrigation dams. This is an innovation in the implementation of IWRM in Ghana. In most countries local authorities are only involved in reticulation of water which they purchase from water and sanitation boards (Fuest, 2005:13, Focus Group Discussions, 2010).

The DAs have the authority to pass by-laws that regulate community affairs. They play an important role in regulating water resources use, especially with regard to environmental aspects in instances where regulations made at the national level do not exist. The responsibilities for water resource management at district level are shared between the public administration which is the executive arm, and the general assembly of the district which is the legislative arm. The committees and subcommittees in charge of agriculture and domestic water supply constitute relevant platforms for discussing citizen demands and for coordinating with line agencies. The district director of MOFA is the secretary of the district assembly committee in charge of agriculture. The district assembly members thus have the option to discuss suggestions or complaints from their constituencies with respective line agency representatives. The decisions and activities of the DAs are meant to be supported by the sub-district administrative structure. The unit committees and area councils do not play a major role whereas the chiefs and the elected assembly members play an important role in settling disputes. The decentralisation of

irrigation scheme management to local authorities is commendable however, this task can be better located within district assemblies since the latter are responsible for setting pollution and allocation by-laws (Birner, et. al, 2005:18, Focus Group Discussion, 2010).

In the section below, the following will be scrutinised: MOFA, CWSA, the Ministries of Health and Fisheries, Cooperatives and Community Development, EPA, the Volta River Authority, the Departments of Hydrology and Meteorological Services, Research Institutes, WRC, Forestry, Minerals and Lands Commissions, traditional authorities, WUAs, and WATSAN committees in decentralisation, privatisation, recognition of water as an economic good, water vending, community management and commercialisation under the rubric of IWRM.

5.4.2 Ministry of Food and Agriculture

The Ministry of Food and Agriculture's water resource-related functions are performed through regional and district offices together with the Ghana Irrigation Development Authority (GIDA). The regional directorate and the district offices of MOFA support agricultural development, including livestock development through various programmes and activities. With regard to water resource management, MOFA supports the construction and rehabilitation of small dams and promotes irrigated vegetable cultivation. MOFA also supports and promotes crop diversification, soil conservation, and water-harvesting techniques, and explores new approaches in irrigation. The government authority in charge of irrigation is the GIDA, a semi-autonomous agency which operates under MOFA. GIDA is expected to exercise management control over irrigation dams, associated catchment areas, the drainage of irrigated areas, and general water quality. Farmer participation in the management of irrigation projects started in 1987 with the passing of a legislative instrument, LI 1350, which legalised and streamlined the GIDA staff management role and incorporated farmer participation in project management. GIDA provided technical expertise for the construction of small reservoirs which includes both the design of these reservoirs and the supervision of the contractors in charge of constructing or rehabilitating them. Large-scale irrigation system projects are not managed by GIDA, but by an independent agency. The role of GIDA in developing water

resources of the country for irrigated farming, livestock improvement, and fish culture remains controversial since statutory water resource development functions are performed without any ownership of the resource. Independent agencies are the ones who hold all the water rights at the expense of subsistence farmers (Birner, 2005:19, Opoku-Agyemang, 2005:273).

5.4.3 Community Water and Sanitation Agency (CWSA)

CWSA is the core government agency at regional level concerned with the provision of portable water to rural communities and small towns. CWSA is responsible for ensuring that there is community ownership, beneficiary capital cost contribution, private sector participation, cost-recovery related water-tariffs, and a sustainable supply of drinking water in all the projects implemented in rural areas (Fuest, 2005:24). CWSA works in partnership with DAs and district water and sanitation teams (DWSTs). CWSA supervises the provision of boreholes to communities following a demand-driven approach. The project cycle of providing drinking water to communities starts with the sensitisation of district assemblies, NGOs and other stakeholders like chiefs, local opinion leaders, unit committees, and area councils. These officials are in turn supposed to inform communities and encourage them to write applications for facilities to the DAs. To ensure community commitment towards taking good care of the infrastructure, a community contribution of 5% of the capital cost is required and a further 5% is contributed by the DAs. After receiving applications, the DWSTs go to the communities to assess their local water problems and to verify that the application was a true community initiative. They then hand the proposal to the DA to select communities. The actual implementation of the provision of drinking water facilities is contracted out to different private sector enterprises. Consultancies send technical assistant teams who are responsible for community mobilisation and training. Hydrological consultants identify the sites and contractors do the drilling. The DWSTs guide the whole process and are responsible for monitoring it after the technical assistants have fulfilled their contracts (Birner, et. al, 2005:20, Eguavoen, 2008:162, Fuest, 2005:24).

In rural areas the most common technology available is boreholes. Frimpong, Oluwoye and Crawford (2003:322) highlight the following problems associated with groundwater-drilling especially when communities are expected to pay for the operation and maintenance of the facilities. There is poor technical performance due to improper planning which results in a number of wells being abandoned, thereby causing project delays and cost overruns. Another problem is the numerous series of activities involved in a water drilling project which calls for the use of creative scheduling techniques and for schedules to be updated on a regular basis. A great deal of coordination among these activities is required to avoid delay, especially in public projects. Due to a lack of skilful management, little attention is paid to resource allocations, namely human, financial, and material resources (Frimpong et al, 2003:322).

CWSA is not involved in subsidising rural water and sanitation schemes, communities are expected to contribute 5% towards the scheme prior to the construction plus an annual borehole fee. As a result, most of the wells and boreholes are dilapidated and the access backlog is increasing (Eguavoen, 2008:162). Various members of the WUAs who participated in the study raised concerns about the role of the CWSA in not providing subsidies to rural households and expecting them to construct, operate, and maintain schemes without any form of government support (Focus Group Discussion, 2010).

5.4.4 Ministry of Health and Ghana Health Service

The Ghana Health Service is the implementing agency of the Ministry of Health. At the community level it runs hospitals and health posts in large communities, while in other communities basic health care is undertaken by community health volunteers. The major role of the health service with regards to water resources is the control of water-borne diseases. These include diseases caused by unsafe drinking water such as diarrhoea, and diseases caused by vectors that rely on water such as malaria, schistosomiasis, and elephantiasis. The health service and MOFA investigate the health effects of irrigation systems and provide health education on water-borne diseases in communities where small reservoirs are constructed or rehabilitated by MOFA. According to the Department of Health there has been a reduction in the number of households diagnosed with

illnesses associated with waterborne diseases since the rehabilitation of the sanitation infrastructure in Accra as a result of the intervention by the African Development Bank (Birner, et. al, 2005:20, Ghana Government, 2011, Focus Group Discussions, 2010).

5.4.5 Environmental Protection Agency (EPA)

The EPA belongs to the Ministry of Environment, Science and Technology and maintains and enforces standards for wastewater discharge into water bodies. It is also in charge of conducting environmental impact assessments (EIA). An EIA is required by law for different types of projects, for instance the construction and rehabilitation of small dams require EIAs. The organisations proposing a project has to submit a form in which they describe the potential environmental impact and what measures will be taken to deal with them. Two officers of the EPA then visit the site to verify the information. If a permit is granted they also monitor whether the enterprise has acted according to the provisions of the permit. An EIA includes a social assessment in which the overall benefits of a project are compared with the social well-being of the communities, using a cost-benefit analysis. An EIA may involve a public hearing but for small dams no public hearing is required. The EPA takes into account the approval of the chief and the approval of the DA as an indication of the “communities” opinion. EPA is aware that approval by a chief may not necessarily represent the opinion of all villagers. This is considered when the EPA visits a site and conducts an inspection *in loco*. The head office of the EPA must also approve the requests for permits. In the water and sanitation sector, the EPA is responsible for granting pollution licenses to various government agencies responsible for water use and discharges (Birner, et. al, 2005:21, van Edig, et al, 2007:35, Fuest, 2005:11).

In 2012, the EPA shut down a portion of Gold Fields’ Tarkwa operations and ordered it to stop discharging water from its heap leach pads, affecting roughly 20% of production. Though Gold Fields argued that its mine was in full compliance with local environmental laws and regulations, the agency demanded that it install water treatment plants to purify the effluent. Gold Fields expects to lose about 15 000 ounces of gold because of the

closure, and is bitter about the way the matter was handled (Ryan, 2012). The steps taken by EPA and WRC to deal with polluters, regardless of their country of origin, demonstrates its commitment to protect water resources as well as the political will of the National Democratic Congress's government (Focus Group Discussion, 2012).

5.4.6 Ministry of Fisheries, Department of Cooperatives and Community Development

Initially the fisheries department was part of the Ministry of Food and Agriculture but became an independent ministry in 2005 as a result of the increased importance of fish for improving food security and income generation. The MOF is responsible for regulating over-fishing in various rivers of the country. It has been established that both small and large dams serve as a breeding habitats for different fish species. More and more fish species are becoming endangered and require regulatory frameworks to protect them (Birner, et. al, 2005:21).

The Department of Cooperatives and Community Development is involved in the organisational issues of small dam irrigation. The department is also responsible for the formalisation of the water user associations (WUAs) as cooperative societies and provides training to their members. The focus is placed on issues such as group dynamics (Birner, et. al, 2005:21).

5.4.7 Volta River Authority

This authority is responsible for issues related to the production of electricity through the Akosombo Dam built in 1965 which is the major source of electricity in the country. In the past severe energy crises have hit the country in times of drought, such as the devastating one of 1998 when the lake level dropped below minimum causing major power outages (van de Giesen, Andreini, van Edig and Vlek, 2001:201, van Edig, van de Giesen, Andreini and Laube, 2002:3). Because of Akosombo's water needs, the Volta River Authority is likely to be critical of all extractions of large amounts of water from the upper river bodies. The largest project in the Volta Basin is the dam which reaches a height of 134m and forms Lake Volta, one of the world's largest artificial lakes. It covers

3.5% of Ghana's surface area (van Edig et al, 2007:32). While the major activities of the Volta River Authority focus on the south of Ghana where Akosombo is located, the authority is concerned with the whole catchment area of the Volta Lake. In the past it provided funding and support for environmental projects, focusing on the river and its banks. The river is a trans-boundary shared watercourse governed in accordance with the UN Convention on the Law of the Non-Navigational Uses of International Watercourses. Although Ghana was not a signatory to this convention, it is acknowledged in its water and sanitation policies. The convention defines an international watercourse as part of a river which is situated in different states (Birner, et. al, 2005:21, Opoku-Agyemang, 2005:275, van de Giesen et al, 2001:199). The Volta Basin is shared by six countries, namely Ghana, Mali, Burkina Faso, Benin, and Cote d'Ivoire (van Edig, et al, 2007:32).

5.4.8 Hydrology Department and Meteorological Service

The Hydrology Department of the Ministry of Works and Housing conducts measurements on the stream flow of the major rivers. The department does not collect data on groundwater and is not involved in the testing of water quality. For specific purposes, it uses hydrological modelling software. The meteorological service maintains a network of meteorological measurement stations in the regions and cooperates with MOFA which also maintains measurement stations and collects data on rainfall (Birner, et. al, 2005:21, Odame-Ababio, 2002:160). Fuest (2005:52) points out the weakness in the Department of Hydrology and Meteorological Service as the failure to produce scientific data on aquifers and groundwater to guide the drilling of boreholes in rural areas. This is primarily due to a lack of political will; a lack of funding for laboratories and technical equipment; a lack of legislation on data acquisition and management; an overlap of the mandates of various institutions (e.g. the CSIR, WRI, and Department of Hydrological and Meteorological Service); many institutions collecting water quality data (e.g. GWCL, EPA, WRC, CWSA); basing groundwater data collection on bore logs associated with the installation of boreholes; a lack of digitised hydrological data at WRI; and a lack of institutionalised procedures to coordinate scientific information in the water resource management sector (Fuest, 2005:54). These weaknesses pointed out by Fuest

(2005) were confirmed in focus group discussions five years later (Focus Group Discussions, 2010).

5.4.9 Research institutes

The Council for Scientific and Industrial Research (CSIR) which belongs to the Ministry of Environment, Science and Technology, operates several research institutes, two of which are important with regards to water resource management. The Water Research Institute (WRI) was formed in 1996 by merging the Institute of Aquatic Biology and the Water Resources Research Institute. The WRI has a mandate to conduct research into water and related resources such as groundwater resources availability, quality, and quantity. The WRI also conducts research on hydro-meteorological and hydrological data for planning and research, irrigation technology, rainwater harvesting, eco-technology for rice production, water management for rice production, and manufacturing of bio-insecticides for the control of malaria and bilharzia vectors. The Agricultural Research Institute conducts research on various water resources management themes, such as rain-fed and irrigated crop production, innovations for water harvesting, and strategies to improve the productivity of water use in agriculture (Birner, et. al, 2005:22, Odame-Ababio, 2002:160).

The weakness of studies conducted by CSIR is that they tend to be biased in favour of engineering and natural sciences. The social science aspects that focus on socio-cultural, political, and gender-related issues are ignored. The reason is that the water sector is dominated by technical staff members who have no training in social and gender issues, plus the economists tend to delve deeper into the neo-classical economics of price elasticity of demand; the water sector in Africa is therefore premised on demand management and there is a noticeable shift away from supply-led management (Fuest, 2005:55, Focus Group Discussion).

5.4.10 Water Resources Commission (WRC)

The Water Resources Commission was established in 1996 by the Water Resources Act. The creation of this institution was recommended by the Water Resources Management

Studies supported by major donors (CIDA, DANIDA, DFID, CfD, GTZ, UNDP and the World Bank) (Ghana Government, 1996: VII-4002, van Edig et al, 2007:35). Prior to the creation of WRC, the management of the country's water resources was fragmented among various institutions with no clear policy for coordination (Opoku-Agyemang, 2005:273, Rodgers, van de Giesen, Laube, Vlek, Youkhana, 2007:302). The acquisition of water rights and water use fell under general common law riparian rules as part of land law. Until the enactment of the Water Resources Commission Act of 1996, customary water rights in Ghana were by and large regarded as part of land rights (Burchi, 2005:322). The WRC started operations in 1998 and serves as an umbrella organisation to coordinate the different government agencies involved in water management (van Edig et al, 2007:35). The Water Resources Act stipulates that members of the WRC should be representatives of all the government agencies involved in water resource management, and should include a member appointed by the National House of Chiefs plus two additional members, one of which should be a woman. Apart from the women's representative, WRC decided to invite a representative of the environmental NGOs to serve on the board as well (Government of Ghana, 1996: VII-4003, Van Edig et al, 2007:36). The government organisations include the following: the Volta River Authority, the Ghana Water Company Limited, the Irrigation Development Authority, the Forestry Commission, the Minerals Commission, the Water Research Institute, the Hydrology Department of the Ministry of Works and Housing, the Meteorological Services Division, the Environmental Protection Agency, organisations producing portable water, an independent chairperson, and the executive secretary of the WRC (Ghana Government, 1996:VII-4003, Rodgers et al, 2007:30, Odame-Ababio, 2002:162)

The Water Resources Commission Act declares in section 12 all water resources to be state property, by vesting the property and control of the water resources in the president on behalf of and in trust of the people of Ghana. The Act assigns the responsibility to regulate and manage the use of water and to co-ordinate all policies regarding water resources management to the WRC (Ghana Government, 1996: VII-4005, Opoku-Agyemang, 2005:273, Burchi, 2005:323, Rodgers et al, 2007:302). The WRC has the following responsibilities as per the Water Resources Commission Act, 522 of 1996:

It is expected to propose comprehensive plans for the utilisation, conservation, development, and improvement of water resources. In addition to the above, the WRC is expected to initiate, control, and coordinate activities connected with the development and utilisation of water resources; to grant water rights; and to collect, store and disseminate data or information on water resources. It is also required to monitor and evaluate programmes for the operation and maintenance of water resources, to advise the government on matters likely to have an adverse effect on the water resources of Ghana, and to advise pollution control agencies on the management and control of the pollution of water resources (Ghana Government, 1996: VII-4003, Rodgers, et al, 2007:303).

The major functions of the WRC are advisory, coordinating, and regulatory. The regulatory functions rest specifically with the mandate of the WRC to register and regulate the water use rights enshrined in Section 16 of the Water Resources Commission Act 522 of 1996 (Ghana Government, 1996: VII-4006, Opoku-Agyemang, 2005:273). This mandate refers to the use of water for commercial purposes, since the use of water for domestic purposes does not need to be registered under the Water Resources Commission Act. The Act does not specify a decentralised governance structure, but allows for the formation of sub-commissions as necessary. The WRC uses this as the legal basis for the development of basin boards that are supposed to implement the functions of the WRC at a lower level. These decentralised boards are not tied to administrative boundaries, but integrate water governance at river basin level. The first pilot basin board was developed in the Densu River basin. Water pollution is the major challenge in this area. As a second pilot project, the commission chose the upper White Volta Basin. Here the importance of a coordinating actor was emphasised because of cross-boundary water issues since the White Volta Basin stretches into Burkina Faso and to a smaller extent into Togo (Ghana Government, 1996: VII-4007, Birner, et. al, 2005:23, Opoku-Agyemang, 2005:274, Rodgers et al, 2007:303).

Section 13 of the Act prohibits the use of water resources without authority from the Water Resources Commission. No one can divert, dam, store, or use water resources, or

construct or maintain any works in a water resource without a license (Ghana Government, 1996: VII-4005). Communities are involved in WRC activities through traditional authorities (Rodgers et al, 2007:302). In the case of the Densu River abstraction (diverting the flow of the water from a river e.g. for irrigation purposes), both the DA and the Akyem Abuakwa stool (traditional authority) play an important role, since the source of the Densu River is within the jurisdiction of the Akyem Abuakwa traditional authority. This authority is one of the stakeholders that participates in the Densu Basin Water Board (Opoku-Agyemang, 2005:274), together with traditional authorities, DAs, a traditional water priest and priestesses (locally called tindanas). Water linguists are also consulted because they have indigenous knowledge on sacred groves and buffer zones. Their voice is crucial in assisting WRC in the granting of licenses. Any abstraction of water exceeding five litres per second is handled by the DA on behalf of the WRC. At local level the DA grants licenses in consultation with the communities, spiritual and traditional leaders, and the WRC (Laube, 2007:420).

There are many reports of unsustainable use of water after the the granting of licenses and DAs do not always have the capacity to institute public participation processes. Laube (2007:420) highlights the power relations in the hands of district administration, politicians, neo-traditional authorities and local “big men” as part of the problem associated with the decentralisation of the WRC’s granting of water rights. At the national level, the WRC does not have the power to control the use of water resources if important economic and political interests are at stake (Opoku-Agyemang, 2005:275, Laube, 2007:420).

According to Laube (2007:420) the WRC fails to influence crucial water sector decisions, for instance in the mining areas, and in the construction of large dams, but is instead used by powerful actors to get water use permits to legitimise controversial claims on water resources despite serious ecological and social concerns. There is a feeling that the penalty meted out for transgressing the WRC Act of 1996, which is a maximum of one year imprisonment or two hundred and fifty penalty units of water (Section 15 of the Act), is meagre compared to the transgressions. It is also not enforceable against a certain

class of people in Ghana. The process of licensing all major commercial users such as the mining industry, irrigation schemes, the Ghana Water Company Limited, and the hydropower industry, began in 2002. All the money collected as a result of licensing, raw water charges, application fees, penalties, and fines prescribed in the Water Use Regulation LI 1692, are saved through a water management fund created in 2001. The meagre funds in the account of WMF clearly indicates that the licensing, raw water charges, application fees, penalties, and fines are not levied as expected to various commercial users (Focus Group Discussions, 2010, Ghana Government, 1996: VII-4006, Odame-Ababio, 2002:165).

Small and domestic water users such as the community groundwater schemes established by the CWSA and managed by DAs, fall below the threshold to attract payments of raw water charges, but would be licensed through the registration of the drilling companies. The abstraction charges collected are used to contribute to the implementation and sustainability of IWRM. This WMF arrangement is strange since it is not meant to help DAs and decentralised institutions to develop capacity to regulate water use and management within their jurisdictions, but to drive IWRM from the national level through the WRC (Odame-Ababio, 2002:165, Focus Group Discussion, 2010).

Fuest (2005:46) highlights staff shortages (about 200), budget constraints, brain drain, lack of suitable qualified employees, domination of CWSA staff by “technical” experts who are not gender and poverty aware, low motivation of staff, lack of hydrological information, lack of focus on water quality improvements, lack of enforcement of drilling license compliance, environmental standards by both the WRC and EPA, political patronage, and role clarification amongst district assemblies, WATSAN, and WUAs, as some of the limitations of the CWSA within the IWRM platform in Ghana. Fuest’s views (2005:49) were confirmed in the field regarding the modalities of implementation of a sanitation improvement programme sponsored by the AfDB which is characterised by similar failures that the World Bank and the African Development Fund experienced in The National Community Water and Sanitation Programme (1999-2004) (Focus Group discussion, 2010).

5.4.11 Forestry, Minerals and Lands Commissions

The Forestry Commission is concerned with water resources because of the value of forest belts for erosion control and because of the micro-climatic and hydrological impact of forests. The commission is also involved in water related issues because of the possible adverse effects of mining on both the quality and availability of water. The Lands Commission is in charge of the registration and administration of land rights. MOFA has pursued a drive to register land resources to be irrigated by small-scale irrigation schemes in the name of the DAs. Land rights in Ghana are governed by a variety of different laws. Customary land law and the role of customary authority in land management are recognised by formal laws and regulations (Birner, et. al, 2005:23, Opoku-Agyemang, 2005:273). Prior to the establishment of the above commissions the Minister of Mines and Energy had powers to grant licenses to mining companies for the diversion, obstruction, or altering of a river course within a mining area. This function is now performed by the Water Resources Commission. Any mining company granted a water license is required to re-apply since the responsibilities of the Minister of Mines and Energy enshrined in the Mineral and Mining Law, PNDCL 153, Section 21, fall in the hands of the WRC (Opoku-Agyemang, 2005:273). There is evidence of overlaps in the functions of the EPA, WRC and Forestry, Minerals and Lands Commissions. Instead of all of the above institutions working together in an integrated manner, they tend to duplicate efforts and contradict each other (Focus Group Discussion, 2010).

5.4.12 Traditional authorities

Ghana is a typical case of “mixed government” where governance structures based on both customary law and modern law coexist. Institutions based on customary law have been formally recognised in the constitution. The major institutions which represent traditional authorities in the political system are the National House of Chiefs and the Regional Houses of Chiefs. Legal regulations stipulate that traditional authorities can only engage in political affairs in a non-partisan way. Traditional authorities do not have formal representation at district and sub-district levels. However, they play an important role in managing public affairs at the sub-district level. The institutions of traditional

leadership in Ghana are influenced by the British indirect rule system of the colonial era (Burchi, 2005).

Two main types of indigenous political systems exist in most parts of the country. There are traditional areas with rulers who maintain central authority and there are areas without traditional rulers or centralised authority systems. There is a traditional leader who is also a member of the Water Resources Commission. Burchi (2005:326) argues that participation of customary rights holders and groups in government-driven decision-making on matters of policy, planning, and day-to-day water resource allocations, must be meaningful. Membership of a lone traditional leader in Ghana's fifteen-member Water Resources Commission hardly lives up to this standard, and pays lip service to the role and significance which customary water rights are reckoned to have in that country (Burchi, 2005:326).

There are also areas in Ghana ruled by earth priests (also known as *tindanas*). The spiritual role of *tindanas* is to conduct earth shrines and distribute agricultural land whilst considering the spiritual value of land. They play an important role in the redistribution of land under irrigation systems and their signatures are crucial in new land use agreements. The *tindanas* are spiritual rather than political leaders of their communities and their role coexists with the role of chiefs who were empowered as political representatives under the British system of colonial rule and have maintained this role ever since. The traditional leaders are in charge of those parts of rivers and streams that flow through the land areas they are responsible for. In most parts of the country irrigation using small reservoirs or other systems is not part of traditional practice and therefore the role of traditional leaders in irrigation schemes is minimal. According to Laube (2007:420) traditional rules, social networks, political patronage, and outright corruption continue to influence the ways in which resources are allocated and managed, often to the benefit of wealthier, better connected and more powerful actors (Birner, et. al, 2005:24, Laube (2007:420).

“Critical voices of CSOs is neither visible in WRC nor PURC and most of us only get to participate in water and sanitation platforms in Africa Water Week or Africa Sanitation Conference or meetings convened by our partners such as Water Aid Ghana, ANEW and FAN” (Representative of CONIWAS.)

5.4.13 Water user associations and water and sanitation committees

At the community level, two organisations are central to the management of local water infrastructure, namely water user associations (WUAs) for small dams, and water and sanitation committees (WATSAN) for boreholes. The formation of these organisations was promoted by the MOFA and CWSA to implement a demand-driven community-based approach towards the provision of infrastructures. For rehabilitated and new dams, MOFA has facilitated the development of WUAs that are supposed to include all users of the dams, such as gardeners, livestock owners, and fisher-folk. The WUAs have three sub-associations, namely irrigators’ associations, fishermen’s associations, and cattle owners’ associations. The WUA is the local unit of organisation responsible for the management of community dams. The users elect a dam site management committee which is responsible for the management of the system. WUAs also elect executive committees that serve to mobilise community efforts for the maintenance of dam and irrigation facilities. WUAs are responsible for the protection of the catchment area of a reservoir to limit siltation; sealing of cracks in the dam embankment; cleaning and maintenance of the irrigation system including valves, canals and drains; collection of levies for maintenance; and conflict resolution (Birner, et. al, 2005:25). There is a perception that WUAs were created by international donors and therefore do not receive recognition in decentralised government institutions. WUAs are not mentioned in the by-laws that various municipalities promulgate regarding water resource management within district and local assemblies (Fuest, 2005:26, van Edig, et al, 2007:36).

A WATSAN committee consists of selected members of the beneficiary community of one borehole. These committees organise the community in the process of acquiring a borehole, such as assisting in the collection of the 5% community contribution to the capital cost of a borehole, and being responsible for maintenance of the infrastructure. To

avoid free-riding by members, regular payments have to be made to maintain user rights (Eguavoen, 2008:162). WATSAN committees collect regular maintenance fees from water users, organise collective cleaning of the surroundings of a borehole, and are equipped to do minor repairs of the infrastructure. Maintenance requirements that are beyond the capacity of the WATSAN committee members are reported to the water and sanitation teams of the DAs. In practice, membership of a pump community can be gained by the payment of either an initial community contribution or entrance fee. The entrance fee was created to cope with households' inability to pay. Entrance fees are higher than the initial contribution, penalising compound houses which had not been able to afford paying during project implementation. Water rights are only transferred to the entire compound house after the payment of the entrance fee (Eguavoen, 2008:162, Fuest, 2005:26).

The findings of Eguavoen (2008:162) in rural northern Ghana were confirmed in the south of Ghana where rural communities are excluded from access to water due to their inability to pay installation, maintenance, entrance, and other fees levied by WUAs. Traditional and communal ownership of water that has been a feature in Ghana for many years has since been replaced by rural commercialisation of boreholes and shallow wells.

“One of the reasons for our exclusion is that we are unable to pay membership of more than one well which can be advantageous during the dry season where the well we signed membership for is dry and the other one we are not members of is still overflowing. Some households join a reservoir community to use water stored in tanks during dry seasons (Focus Group Discussion, notes taken in 2010)”.

In the case of the hand-dug wells there are no formal organisations or committees responsible for their management at the community level. Many of the hand-dug wells are privately owned and maintained although they are accessible to the entire community. No fees or levies are collected and there are no formal arrangements for their maintenance. Wells in various parts of the country where small dams have been constructed or rehabilitated are managed by the WUAs. The wells are constructed close

to the community dams to provide drinking water for irrigators. In discussion with households in the Densu area, access to privatised hand-dug wells was disputed. In theory, “as communities we can get access to hand-dug wells, but in practice they are built on private property and as much as no fees are levied for their use by people outside the household where the well is situated, they are inaccessible due to fence, dogs and trespassing regulations that owners of estates impose time and again” (Focus Group discussion Notes, 2010, Birner, et. al, 2005:26, Eguavoen, 2008:162).

5.5 Emerging thematic issues

In the implementation of IWRM in Ghana, this study established the following emerging themes in interactions with various stakeholders: a techno-scientific approach to water resource management (Veblenian dichotomy) which is manifested in collective action by various groups; new principles of water and sanitation governance; private property rights; private sector participation; market mechanisms, transaction and information costs; constitutional choice and law of contract; lack of ecological efficiency and sustainability; and negative externalities in sanitation delivery. Section 5.5 presents these themes with examples specific to water and sanitation governance in Ghana within the IWRM rubric.

5.5.1 Veblenian dichotomy and collective action

In Ghana the implementation of IWRM tends to be techno-scientific, dominated by hydrologists and water engineers. Socio-economic and cultural aspects are typically ignored in the CMAs, irrigation boards, WUAs, and WATSAN, and this has led to a Veblenian dichotomy. The community ownership and management concept that dominates IWRM implementation and issues of access to adequate sanitation, cannot be divorced from the cultural, socio-economic, and micro-political setting, or the physical environment and the larger environment within which they occur. A Veblenian dichotomy is reflected in the technical responses to an increasing need for potable water resources driven by water professionals whilst communities are expected to pay for the construction, operation, and maintenance of this infrastructure. Water professionals design sanitation infrastructure such as the KVIP but it becomes the responsibility of

communities to empty them. Otherwise, they pay for health, costs and other negative externalities associated with the latrines (Nabli and Nugent, 1989, Miller, 2003, Fuest, 2005:5).

Collective action in Accra is demonstrated by the establishment of a Coalition Against Water Privatisation (CAWP) hosted by ISODEC, CONIWAS, and MOLE. It arranges conferences and citizen action and assemblies, aiming to intensify resistance to private sector participation in the water sector, and campaigns for food security. The Ghana Coalition of NGOs in Water and Sanitation (CONIWAS), created in 2001, “work(s) in partnership with sector players to influence policies, remove barriers and promote access to potable water, sanitation and improved hygiene for the poor and vulnerable”. According to the coalition, giving NGOs one voice for advocacy and lobbying has been one of its major benefits (CONIWAS, 2008).

When faced with a Veblenian dichotomy, communities begin to mobilise against the implementation of IWRM and its associated concepts of community-based supply systems, water as an economic good, private sector participation, and the devolution of functions from national to local levels of government with the objective of improving efficiency and accountability (Fuest, 2005:5). The other type of contradiction is the shift of various levels of government from implementation to facilitation and regulation, and their former roles being taken over by the private sector and NGOs. Members of the CAWP organised many protests to raise concerns against the privatisation of water in urban areas and community management in rural areas. A review of the management contract by the Ministry of Water, Public Works and Housing dealt with in section 5.3 above, is the result of pressure from CAWP and ISODEC. Patrick Apoya, the former executive secretary of CONIWAS remembers:

“We urged the Minister of Public Works and Housing to review privatisation and we enjoyed the support of Vandana Shiva and other members of the Council of Canadians when we protested against privatisation during the Third World Water

Forum in Osaka, Japan in 2003. When we returned in Ghana, government was keen to meet with CONIWAS.”

Crook and Aye (2006:52) identified another form of collective action in Kumasi and Accra. In water and sanitation projects citizens were encouraged to engage in collective action to provide public goods in co-operation with public authorities. The failure of this special type of collective action is the fact that it requires the kind of trust and working relationships which are frequently totally absent (Crook and Ayee, 2006: 52, Focus Group Discussion, 2010). Patrick Apoya recalls:

“CONIWAS used both approaches, we met with government institutions and we also protested locally and embarrassed state institutions globally when they justified privatisation.”

5.5.2 Principles of water and sanitation governance

The IWRM processes in Ghana have been hailed as open, transparent, participative, accountable, effective, coherent, efficient, communicative, equitable, and integrative on the basis that it was a robust process which involved government, private sector, CSOs and river basin communities (Odame-Ababio, 2002:163). However, the role of international donors in imposing IWRM, decentralisation, privatisation and community management as policy conditions is under-estimated (Fuest, 2005:49). Odame-Ababio (2002:165) highlights some of the IWRM successes in Ghana, namely promoting rational use in the conservation of water resources; maintaining a hydrological database to ensure efficient service delivery; and instituting agreements on water allocations between mining industry, GWCL, irrigation schemes, CWSA, district assemblies, and hydropower industry at the local level. Another success is the development of a communication strategy by WRC which created public awareness and drove various education campaigns which strengthened IWRM ahead of the 2005 WSSD deadline of adopting IWRM plans by the UN member states (Odame-Ababio, 2002:165).

Local water laws contribute to a rights-based allocation of household water. Water rights in pump communities stress the equity of member compounds in ownership, access, and power, ignoring the social, economic, gender, or age status of individuals living in the households of member compounds. The bottleneck for the receipt of such water rights is the membership in a pump community (Eguavoen, 2008:163). The establishment of WUAs, WATSAN committees, and the representation of CSOs in the WRC is commendable, but the structures are not working. The collection of 5% capital cost on boreholes, small dams, and operation and maintenance as well as the pay-as-you-use scheme are criticised as not taking into consideration the poverty situation of communities (Laube, 2007, Eguavoen, 2008:162, Fuest, 2005:12). In addition the implementation of the 5% capital cost contribution from beneficiary communities and district assemblies was not uniformly applied by all donors. The AfDB, JICA, CIDA and EU provided 100% subsidies whereas the World Bank and the KfW insisted on a 5% contribution from communities as well as DAs. All donors agreed on structural adjustment programmes, private sector participation, full cost recovery, and increasing prices for the rural poor whereas urban communities were not expected to make any capital contribution (Fuest, 2002:50).

Participants in this study were critical of the rights-based allocation of household water postulated by Eguavoen (2007:163), and based on a private property rights perspective. According to Mr Nkrumah, a member of a WUA (in a Focus Group Discussion, 2010):

“If we did not embark on collective action by not excluding those that are unable to pay borehole fees, fewer and fewer rural households would have access to water in sufficient quantities and quality they required. There were rural villages in which water was available free of charge and in the next village they are subjected to full cost pricing, operation and maintenance fees, pay-as-you-use fees and capital contribution. Our role was to frustrate CWSA up until they remove a clause demanding that those that are unable to pay should be excluded in the contract with donors.”

5.5.3 Institutional mechanisms

The formal rules of the game contained in the Water Resources Commission Act, and implied by the availability of institutions such as the EPA, CWSA and DAs, are based on donor institutional frameworks derived from blueprints, rules, and regulations devised in the ministries of their respective home countries, and could not prevent the sedimentation of dams, over-use of wetlands, effluent discharge in rivers and lakes causing diseconomies and externalities in Ghana. The IWRM institutional mechanisms created for the developed world, are difficult to implement in Ghana because they were not designed for the country's socio-cultural, political, economic, and institutional context (Fuest, 2002:51).

The reasons why rural communities are “hunting” for water in Ghana are ‘price determinism’ and imported institutionalisms which advocated increasing tariffs to benefit the poor, dominating the Accra Urban Water Management and Vision 2030 strategy, and enforcing payments and cut-offs by the Ghana Water Company Limited and other meso institutions responsible for water supply and sanitation delivery (Fuest, 2002:61). Lowering the demand for water, water rationing, and inequitable distribution of water which have led to water vending in Ghana, are some of the outcomes of the “imported” institutional mechanisms which are not even implemented by donors in their own home countries. A statement made by CONIWAS highlights the fact that:

“The separation of rural supply and urban supply, with water supply and sanitation are both examples of institutional mechanisms that perpetuated rural water and sanitation scarcity in Ghana. GWCL is supposed to work hand in hand with CWSA, but limiting inexperienced CWSA to rural areas, was a setback to DAs that are not even democratically elected and lack accountability” (Member of Focus Group Discussion, 2010).

5.5.4 Property rights

Under Ghanaian customary law water is free and everyone is in principle entitled to its use as a community resource. The ownership of water resources resides in communities

and not individuals. In times of drought and scarcity, the whole community must share the use of the streams/rivulets, irrespective of whose land is closest to the water body. It is the duty of the whole community, through chiefs and religious officers, to protect water resources from pollution and desecration. The establishment of the WRC in 1998 brought about changes, which saw common property rights revised to become private property rights (Opoku-Agyemang, 2005:272) Households that do not pay in the Densu Delta are not allowed to cultivate during dry seasons. Michael, who is farming on the bank of the Densu River, laments the CWSA systems:

“We are owners of this land, but because we are unable to pay borehole fees, our land and water rights are taken away by CWSA. We are not allowed to cultivate our land and we are prepared to defy all these foreign laws and through our WATSAN committees we continue to allow peasants to cultivate their land even if they did not pay their 5% contribution.”

Water schemes in the Densu Delta are operated and managed by utilities, vendors, communities, and private providers, and the service standards are determined by who renders the service. There is no regulation to protect fish species and water quality is compromised as a result of private property elements whereby government is not regulating the protection of fauna and flora (Burchi, 2005:324). A member of a WATSAN committee, Mr Johnson, is unhappy with the poor state of boreholes in Densu:

“As you walk few meters from here, you find that one borehole is working, another one is not working, the question you must ask: who is the owner? If it belongs to GWCL it is working, if it belongs to DA, it is not working and those built by NGOs are all working. We are frustrated by having different services in one place, cry my beloved Ghana.”

The management of water resources is decentralised to users under self-regulation. The Water Resources Commission Act, Act 522 replaced the riparian system of public and common property rights with a system of the prior appropriate doctrine. This new system

created tensions between various assemblies and local authorities with regard to access to water among downstream and up-stream users. In the riparian system of public and common property rights, based on English common law, the new Juaben municipal assembly constructed a dam in the Densu River system which was shared with Akaupen South or the GA districts downstream. There was no problem because institutional arrangements based on public and communal property rights maximised the benefit to both riparian areas. In the current institutional arrangement, brought about through the implementation of IWRM, private property rights result in up-stream users benefiting at the expense of downstream users. The promulgation of the Water Resources Commission Act brought about a significant shift in property rights in favour of markets, and undermined the good relationships and cooperation that existed for many years under the English common law dispensation (Opoku-Agyemang, 2005:272).

The new statutory water licensing also did not consider customary practices and ownership, or the communities who owned the water resources prior to the promulgation of the Water Resources Commission Act of 1996, and they were not compensated when the new licensing laws came into effect in 1997. The implementation of IWRM is skewed in favour of private property rights, with a strong focus on recognising water as an economic good (Burchi, 2005:325).

5.5.5 Public and private provision and the role of market mechanisms

The Ghana Water Company Limited is responsible for urban water, whereas the CWSA is responsible for rural and small town provisioning, as indicated in section 5.5. In the Greater Accra (where the Densu River authority is situated), the GWCL is assisted by Aqua Vitens Rand Limited through a five year management contract. Other providers are private kiosks, vendors, and community-managed schemes with different tariff systems: GWCL is the cheapest but inaccessible to people who rent property, informal dwellers, and other low income households. Crook and Ayee (2006:51) trace this to a neo-liberal manifesto to the 1990s whereby the state was meant to steer and not row. It aimed to facilitate the use of markets to buy services for its citizens who are seen as “customers”. This new public management thinking was based on the market disciplines of

contracting-out or the privatisation of public services. The private sector participation prescribed by the World Bank and the AfDB as conditions for financial support did not achieve its intended objectives. There were not enough private companies in the rural areas which could be contracted to render the services required. Local companies were not qualified in the rehabilitation of waste water treatment plants, emptying pit latrines, and the rehabilitation of storm water and sewerage pipes (Fuest, 2005: 65). Most of the functions were therefore performed by the public sector using demand management and community management approaches. The DAs and CWSA lacked experience in dealing with the private sector. NGOs therefore replaced the envisaged private sector in water resource management, especially in rural areas. In the words of an official from the Ministry of Public Works and Housing:

“As a department we put the technical management of our WWTPs out for tender within Accra City and more than 70 applications were received, yet only one company will get this job. In rural areas, even construction of water-points took more than 7 months to get just one application. Even that application, is from either Water-Aid or another International NGO. Private companies are just not willing to tender for work in rural areas. We end up head hunting NGOs because consulting firms are not willing to bid for tenders” (Focus Group Discussion, 2010).

The distribution channels in Ghana’s water sector also leave a lot to be desired. For instance the reticulation in Greater Accra is done by the GWCL, AVRIL, vendors, CWSA, community management schemes, WUAs, and NGOs. Bulk water supply is expected to be sold to WUAs in irrigation schemes, and to WATSAN in rural areas. According to Eguavoen (2008: 163) the regular payment of water tariffs for rural water supply was extended to all rural regions of the country. This introduction of water tariffs was not meant to introduce water as a commodity but rather to provide the means to accumulate local funds for spare parts and repair. Various household members who participated in the study differ with the view held above by Eguavoen (2008:163) regarding the operation and maintenance of water sources.

“Instead of paying for borehole and well maintenance, we believe that the government should be paying for operation and maintenance. Most of us in WATSAN committees were not comfortable to exclude those who are unable to pay for access to water, but the CWSA was adamant that only exclusion of households who are unable to pay will bring about full cost recovery. I do not remember any WATSAN Committee that excluded anyone to date” (Member of Focus Group Discussion, 2010).

The WATSAN/ WUAs committees which refused to exclude households unable to pay borehole fees, from primary domestic use (such as cooking, bathing, livestock drinking, and gardening) argued that it was culturally unacceptable in Ghana to do so. The CWSA found itself at loggerheads with the WUAs that were not implementing the government policy of treating rural water as a commodity. This contradicts the concept of water as a public good (resource) with access protected by the Ghanaian constitution. Another WUA member explained that:

“It was also not feasible to exclude water users that share communal ownership of the land where boreholes are situated and also the fact that boreholes fees are collected at the beginning of the year or in monthly instalments and farmers only have money to pay borehole fees at the end of the ploughing season.”

In 2012, the exclusion of households for non-payment of borehole fees was difficult to implement and CWSA was beginning to come to terms with this reality. None of the WUAs members who participated in the study ever excluded any household for non-payment of fees (Focus Group Discussion, 2010, Eguavoen, 2008:163).

5.5.6 Transaction and information costs and institutional evolution

Construction of water reservoirs costs about Cd1.3 Billion and rehabilitation costs are in the region of Cd.885 million of which the community contribution is expected to be 5%. There are also transaction costs in the form of administrative planning and supervising dam construction costs, capacity-building of the WUAs, negotiation of land rights, and

land registration (Fuest, 2005: 20). Environmental impact assessment (EIA) costs borne by the EPA for each of the projects, together with the applicant, plus the associated information costs, make it difficult for owners of small irrigation schemes and borehole committees to get approval for their projects. There are also cost benefit analyses that need to be adhered to. For example, in rural irrigation schemes it takes at least 10 years before break-even point is reached. The return on assets (ROA) is therefore very low for most subsistence farmers expected to immediately graduate to full scale commercial farmers.

Institutions such as VLOM, and tap and borehole committees have evolved to advance demand management and shift from their prior supply-led orientation. The MDGs have given the international donor community renewed impetus to accelerate the pace of development of the water sector with specific focus on supply coverage. The contradiction is that lack of sustainability in water supply and sanitation infrastructures in Africa is associated with a supply-led approach, and the solution proposed by donor agencies such as the African Development Bank is that of a demand-driven approach (Fuest, 2005:5). IWRM projects funded by the AfDB are premised on such a shift from supply-led to demand-led implementation. IWRM-supporting institutions evolved in championing this particular shift. Even institutions such as WUAs and WATSAN have evolved to recover the costs of construction, costs of operation and maintenance, and transaction and information costs. These institutions are responsible for super exploitation of the poor and vulnerable. CMAs have evolved to support the river basin approach to IWRM (Focus Group Discussion, 2010).

5.5.7 Constitutional choice and law of contracts

Opoku-Agyemang (2005:273) observes that the Constitution of Ghana is explicit regarding water resource management and water rights. Article 268 of the Ghana Constitution refers to the rights which people had prior to the promulgation of the constitution by parliament. The parliament may establish a commission such as the water resources commission to regulate the ownership, abstraction, and management of water resources according to Article 269 of the constitution. Water is owned by the state

through the WRC, but the commercialisation and privatisation of the resource proves otherwise. Water use allocations in the IWRM platform need to be negotiated by various water-users, namely domestic, commercial, municipal, industrial, agricultural, power generation, water transportation, aquaculture, environmental, and recreational. These allocation agreements are required according to the Water Use Regulations 2001, LI 1692 (Opoku-Agyemang, 2005:274). Through this constitutional choice the EPA, the water resources board and the WRC enforce water rights abstraction rights to control pollution. The water management contract between the GWCL and AVRL lasts for a period of 5 years and it is not easy for the government to opt out, especially since voters consistently elect pro-business parties to govern. The law of contract protects transacting parties, e.g. from water being cut off, and if farmers cannot contribute 5% before cultivation. All the rights enshrined in the Ghana Constitution are undermined by IWRM implementation with its infamous recognition of water as an economic good which perpetuates scarcity for those who are unable or unwilling to pay. A member of CONIWAS and the End Water Poverty Campaign raised concerns regarding the lack of subsidy to households:

“Ghana is a member of the UN and we are expected to pay full costs for water and sanitation. Our right to water is guaranteed in the Constitution, but government is not subsidizing even the poorest of our households, therefore in name we have water rights, but in practice water and sanitation services became more expensive. If the UN was able to enforce its statutes, Ghana would be the first country to be expelled from the UN for violating our water and sanitation rights” (Focus Group Discussion, 2010).

5.5.8 Eco-efficiency, sustainability and externalities

Population growth and economic development are causing relatively rapid increases in water demand in the domestic, agricultural, mining, and industrial sectors, as well as in hydropower generation. These uses conflict with each other. Additionally, municipal and industrial pollution is reducing the availability of water as a resource (van Edig, Engel, and Laube, 2007: 31). Discharging effluents from the five waste water treatment works in Accra has violated the right to health and the right of future generations to live in a

healthy environment. Groundwater is being polluted through the contamination of water resources. Leachate is being generated from the decomposition of waste at dumps left to drain in the open, uncovered, and untreated, passing through housing areas directly into surface waters. The drainage of untreated leachate into the surface water run-off eventually reaches the Densu River which is the source from which GWSC supplies portable water to Accra via the Weija reservoir. Leachate from the Mallam Dump contaminates this water source and has dire consequences for the public health of the inhabitants of Accra (Dernaya, 2001:6).

Such pollution results in the degradation of river ecosystems, the killing of fish species, the pollution of rivers, sedimentation, precipitation, salinisation of lagoons, and a prevalence of upstream and downstream diseases amongst households. Fobil (2002:194) highlights the link between poor waste management of the Accra Metropolitan Assembly and the pollution of rivers:

“The Odaw River which runs through the city became the reservoir and dump-site for both liquid and solid waste as waste-handling facilities. At the time it could no longer cope up with the quantities of waste generated. Also, the existing drains were choked with solid waste allowing urban storm to overflow and thus causing destructive floods.”

This situation has remained the same even after establishing institutions responsible for waste management within AMA, namely the Metro Health Department, the Metro Engineer's Department, the Mechanical Engineer's Department, the Waste Management Department (1985), the Waste Management Advisory Committee, and the Metro Public Health Department (Fobil, 2002:195).

The lack of willingness to pay for environmentally friendly products poses a challenge in terms of fertiliser used in agriculture which affects the quality of water. A lack of optimum environmental performance caused by establishing environmental cost accounting and ecological control systems, remains a challenge in Ghana. There is a

general lack of enforcement of environmental laws and of the principles of 'polluter pays' regarding standards of water quality (raw and treated), water resources planning, operation and maintenance, water abstraction, pollution control and protection of catchments. In theory households in Ghana can be charged for sewage and waste collection, but in practice a willingness to pay for these services is difficult to ascertain since very few households have access to these services, even in Accra. Waste is dumped at central container points by households themselves, and user charges are only levied to middle class households with house-to house-collections and household-based septic tank-emptying services.

Many negative externalities result from not subsidising waste collection and adequate sanitation in rural and urban centres in Ghana (Crook and Ayee, 2006:53, Fuest, 2005:67). Market instruments such as pollution tax, levies, and subsidies have been imposed to internalise externalities. The social costs of charging both the polluter and the victim, is very prevalent. Soft loans and tax allowances are given to industries to reduce pollution and market emission permits, in a bid process. There is a lack of pollution reduction standards and enforcement mechanisms such as lack of testing water quality. Building pit latrines next to water points, high precipitation, and flooding are some of the environmental degradation issues identified in the field (Fuest, 2005:66, Focus Group Discussion 2010).

5.6 Water supply and sanitation in Ghana

There are two dominant views to explain the scarcity of water and sanitation facilities in Ghana. The first is that of the donors who cite the causes as lack of efficiency, low prices, and lack of decentralisation and privatisation. The second view attributes scarcity to poor water and sanitation governance, the separation of water supply and sanitation institutions, as the separation of rural water and sanitation supply institutions from their urban counterparts, and the crux of manufactured scarcity. The water supply and sanitation sector in Ghana faces severe problems, partly due to neglect of the sector until the 1990s. Tariffs were kept at a low level far from a reflection of the real costs of the service. Economic efficiency still remains below the regional average, resulting in a lack

of financial resources to maintain and extend the infrastructures (AMCOW, AfDB, EUWI, WSP and UNDP, 2006:27). Since 1994, the sector has been gradually modernised through the creation of an autonomous regulatory agency, the introduction of private sector participation, and the decentralisation of the rural supply to 138 districts where user participation is encouraged. The reforms aimed at increasing cost recovery and the modernisation of the urban utility Ghana Water Company LTD (GWCL), as well as rural water supply systems managed by the CWSA and district and local assemblies (Water Aid, 2006, Doe, 2007:25).

Another problem which partly arose from recent reforms is the existence of a multitude of institutions with overlapping responsibilities. The National Water Policy (NWP), launched at the beginning of 2008, seeks to introduce a comprehensive sector policy, involvement of the private sector in the management of water systems, and the management of rural water through community-management, based on demand management and a 'user pays' principle (Doe, 2007:26, Water Resources Commission, 2008). In Figure 5.2 below, the Volta River system is a clear geo-hydrological illustration of abundant water resources in Ghana which indicates that the scarcity which the African Development Bank, the World Bank and other donors refer to is not actual physical scarcity, but a manufactured scarcity resulting from poor governance, market instruments, lack of subsidies to poor households, pollution, price determinism, privatisation, community management, and foreign institutional and constitutional choices of the government of the day in Ghana. Figure 5.3 below traces the expanse of the Volta Lake to the White Volta River on the north, the Oti River in the northwest of the country, the Black Volta River in the eastern part of the country, and the Daku River in the northwestern part of the country. The river system, tributaries and storage facilities in the Akosombo and other dams also illustrate the abundant availability of water in the country and the poor management thereof as reasons for the economic scarcity that the country is experiencing.

The availability of other smaller lakes such as Lake Bosumtwi situated in the Kumasi-Obuasi and Koforidua areas further illustrates that the Volta River system is not the only

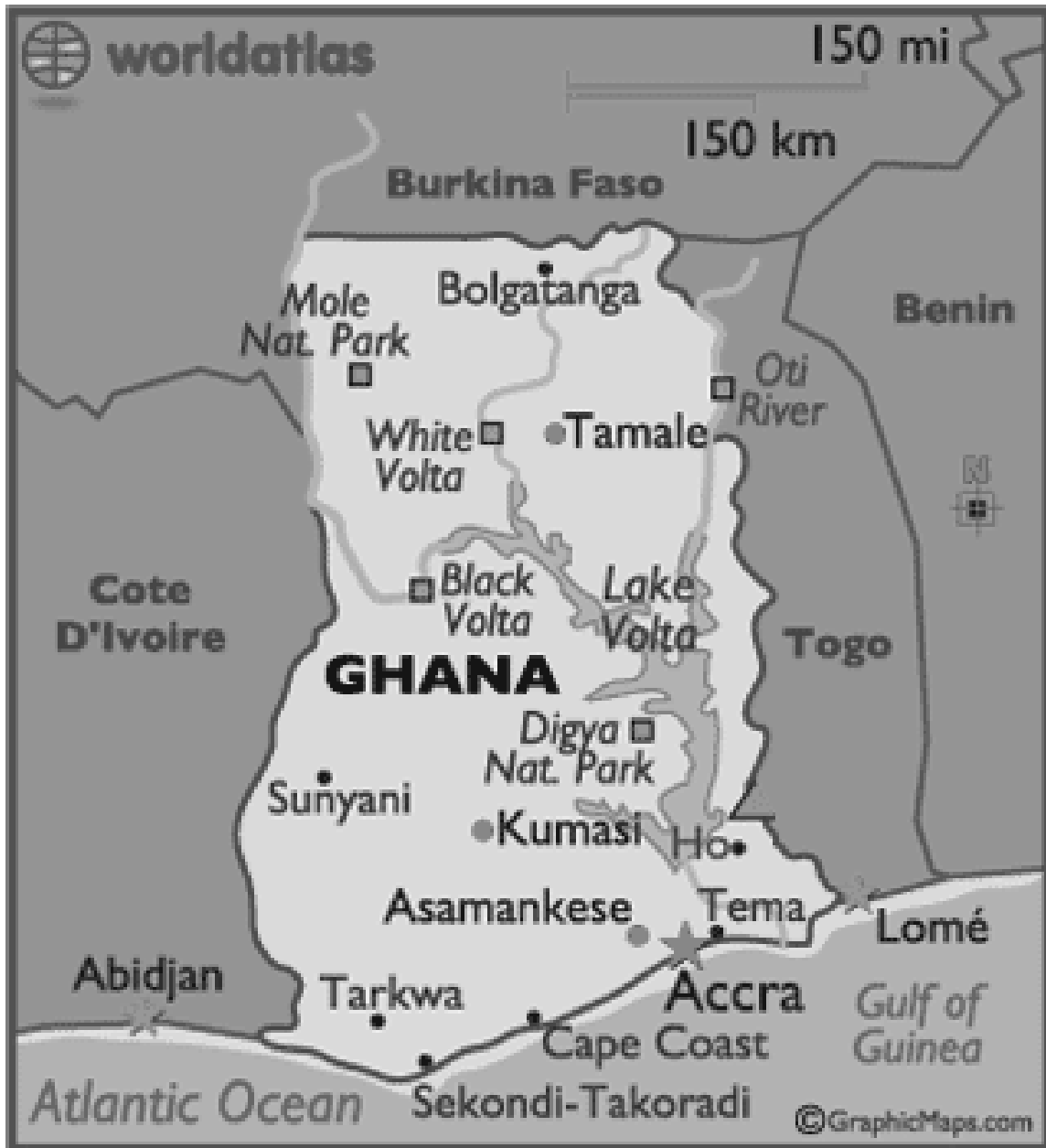
major river system in the country, but poor management of these natural water systems results in fewer households getting access to water and sanitation services, as indicated in section 5.6.2 below. Lack of sustainability, poor drinking water quality, and poor management of waste water treatment plants are the main reasons why water resources are dwindling in Ghana. The answers are not hydrological in nature but hydro-political; the major causes are not associated with the drilling of more boreholes, but with correcting the various institutions charged with the responsibility of managing water and sanitation resources within the IWRM platforms. The major cities in Ghana, namely Kumasi, Tema, and Accra are surrounded by vast water resources in the form of rivers, lakes, and dams (Focus Group Discussion, 2010).

Figure 5.2 Map of Ghana



Source <http://www.worldatlas.com/webimage/countrys/africa/gh.htm> accessed on 29 September 2011

Figure 5.3 Volta River System



Source <http://www.worldatlas.com/webimage/countrys/africa/gh.htm> accessed on 29 September 2011

5.6.1 Number of households with access

Water supply and sanitation infrastructures are insufficient, especially in rural areas, and where sanitation is concerned, there are substantial discrepancies between access data from various sources, partially due to different definitions being applied by the different institutions which provide the access data. The number of households who lack access to water and sanitation in rural areas can be traced to poor institutional mechanisms such as the introduction of the CWSA as the institution responsible for regulating rural water, together with DAs responsible for sanitation provision. The lack of waste collection and sewerage facilities in urban areas (Crook and Ayee, 2006:53), and the community management model in rural areas, are the main reasons for the rural scarcity prevalent in Ghana and Africa (Fuest, 2005:70). Fiadzo, Houston, and Godwin (2000:137) estimate that 60% of Ghanaians do not have access to electricity for lighting, 40% live in mud brick or plastered houses, and nearly all are without indoor sewerage plumbing. According to an assessment by the multi-donor Africa MDG, access to improved water sources is much lower (56%) and access to improved sanitation is higher (35%) (AMCOW, AfDB, EUWI, WSP and UNDP, 2006:27) than data provided by the Joint Monitoring Program for Water Supply and Sanitation of UNICEF and WHO:

Table 5.1 Ghana water data

		Urban (46% of pop.)	Rural (54% of pop.)	Total
Water	Broad Definition	88%	64%	75%
	House connections	37%	4%	19%
Sanitation	Broad Definition	27%	11%	18%
	Sewerage	13%	2%	7%

Source: UNICEF and WHO, 2009

The share of non-functional supply systems in Ghana is estimated at almost one third, with many others operating substantially below design capacity. Moreover, domestic water supply competes with a rising demand for water by the expanding industry and

agriculture sectors (African Outlook, 2007:294). Ghana aims to achieve 85% coverage for water supply and sanitation by 2015 (Water Aid Ghana, 2006:25), which would exceed the MDG's target of 78%. The distance that households need to travel in search of water is estimated as less than 500 meters, where possible. Service level standards are estimated at 20 litres per capita per day in rural areas, and between 20 and 45 litres /day/person in urban areas (Fuest, 2005:13, Water Aid Ghana, 2006:9). In many of the high-density, low income areas, rooms initially intended as toilets have been converted to shops and bedrooms which are rented out because of the high demand for accommodation in Accra (Adank et al, 2011:57).

KVIPs and water closets were introduced to phase out about 5,200 pan and bucket latrines in Accra, as a result of the 2008 Supreme Court ruling that ordered AMA to construct 1,500 water closets and KVIPs by 2010, and to subsidise households that converted their bucket and pan latrines into acceptable standards of sanitation. Most public latrines are operated by private providers using franchises and build, operate and transfer (BOT) agreements. Due to this institutional arrangement, about 41.3% of the GAMA population has access to public latrines, 32% use water closets (connected to septic tanks), 20.8% use private latrines, and 3.2% still use bucket and pan latrines. The number of people who are openly defecating are estimated to be 1.1% and people sharing with neighbours is estimated to be 0.4%. With two years to go before reaching 2014 at the time of writing (2011) the pressure is high to meet MDGs and it is clear from the ground that Ghana is far away from meeting its targets (Focus Group Discussion, 2010).

5.6.2 Sustainability

According to one estimate,

“Only one quarter of the residents in Accra receive a continuous water supply, whereas approximately 30% receive supplies for 12 hours each day, five days a week. Another 35% are supplied for two days each week. The remaining 10%, who mainly live on the outskirts of the capital, are completely without access to piped water.”

The above statistics were confirmed by Doe (2007:37) who established that water flows for one day or a maximum of two days per week (Water Aid, 2006:2, Doe, 2007: 37).

The problem of a lack of water supply and sanitation dates back to the 1990s, where only 27% of the rural population were reported as having access to improved water supply and sanitation services. The lack of water results in water hunting, where women spend more than 5 hours per day fetching water for the household. Such women travel distances between 10 and 20 kilometres trying to reach the next available water source. Water transportation also results in girl children dropping out of school and some experience stunted growth and development as a result (Fuest, 2005:8).

According to the water company Aqua Vitens Rand Ltd. (AVRL), the Accra joint venture of the Dutch Vitens Rand water services BV and Aqua Vitra Ltd, the situation is even worse: in February 2008 some communities in the Accra-Tema metropolis were only served once in a week, once a fortnight or once a month (AVRL, 2008). Doe (2007:38) notes that the time of the day at which the flow starts in the water taps is not known during the days when the water runs. The only assurance is that it will certainly flow at any hour on the designated days. In the process of waiting for water supplies in rural areas it is not possible for people to also think about health and hygiene routines such as washing their hands after defecation in pit latrines. The community management practice of the CWSA in rural areas is deepening the lack of water security, poor operation and maintenance of water points, and inability by many households who are not even considered for subsidies from government, to make payments. Mr Michael who was fetching water from a shallow well stated his reasons:

“We are without water in the past 3 months and waking up at night did not bear any fruits and members of the WUA and CWSA are unable to provide answers as to when are we likely going to receive the service” (Focus Group Discussions, 2010).

5.6.3 Drinking water quality

The lack of clean drinking water and of sanitation systems is a severe public health concern in Ghana, contributing to 70% of diseases in the country. Households without access to clean water are forced to use unreliable and unhygienic sources, and often pay more. The number of water-related diseases such as diarrhoea, skin infections, intestinal worms, and cholera, are predominant in rural areas and there are similar trends in urban areas. Lack of adequate water and sanitation facilities is considered to be the predominant cause of severe illnesses. Children and women are the most affected by such water-related diseases. The water quality is also poor where the population uses surface water to satisfy their needs (Fuest, 2005:8, African Economic Outlook, 2007: 294). Odame-Ababio (2002:159) argues that the high levels of pollution are a result of a shift from the customary management of water resources. Customary laws and practices in Ghana have existed for years and covered the areas of water conservation, pollution control, protection of catchments, and the protection of fisheries. Kinship, reverence for ancestors, and belief in the spiritual power of the earth, combined to give land tenure and customary environmental protection a particular character. Spiritual leaders, referred to as *tindanas* are regarded as earth deities who watch over the spiritual purity of water resources. Because water resources were considered sacred, people were discouraged from fishing on a Tuesday and farming on riverbanks which are regarded as the resting places of river gods and children. In this traditional institutional setting, water was regarded as a public good (resource) and every individual had unlimited right to its use (Odame-Ababio, 2002:159, Fuest, 2005:9). The commercialisation and decentralisation of water resource management brought about by the implementation of IWRM had ignored the importance of river gods, tree deities, and sacred groves (Opoku-Agyeman, 2001, Fuest, 2005:8).

The collapse of the James Town/Korle Lagoon (Up-flow Anaerobic Sludge-Blanket) sewerage treatment plant in 2009 had resulted in raw sewage being directed into the ocean and the Korle Lagoon. Proponents of privatisation argue that the cause of this breakdown was the withdrawal of Taylor Woodrow Construction LTD (UK) which operated the plant since its construction in 2000. The Accra metropolitan assembly which took over the management of this treatment facility have lacked capacity to do so since the handover in 2002, which had resulted in the state of the facility deteriorating to the

extent that only 31% of fluid sewage waste (5000 cubic metres instead of 16, 080 cubic metres per day) was treated per day prior to the complete breakdown in 2009. The cause of the deterioration and eventual breakdown of the treatment facility can be traced to IWRM implementation. The Accra metropolitan assembly was inundated with huge responsibilities that it was not ready to discharge. The efficiency associated with private sector participation in sewerage treatment, which dominated the thinking of IWRM proponents, and the accountability associated with decentralisation had in fact proved to be a total failure. Another treatment plant situated in Tema also broke down as a result of the collapse of the entire oxidation pond treatment plant which was rehabilitated through World Bank funding in the 1990s. This treatment facility has a capacity of treating 20, 000 cubic metres of sewage per day but prior to total breakdown only 1,525 cubic metres of sewage were treated per day (Adank et al, 2011:56, Focus Group Discussion 2010).

5.6.4 Wastewater treatment

It is estimated that in 2000 the urban areas of Ghana generated about 763,698 m³ of wastewater each day, resulting in approximately 280 million m³ over the entire year. Regional capitals account for consumption of another 180 million m³ annually (Agodzo, Huibers, Chenini, van Lier and Duran 2004: 7, Anomanyo, 2007: 16). Only a small share of the generated urban wastewater was collected, and an even smaller share was treated. In Accra, the share of wastewater collected is approximately 10%. Moreover, less than 25% of the 46 industrial and municipal treatment plants in Ghana were functional, according to an inventory undertaken by the Ghana Environmental Protection Agency in 2001. Treatment plants for municipal wastewater were operated by local governments, and most of them were stabilisation ponds. A biological treatment plant was built in the late 1990s at Accra's Korle Lagoon, together with faecal treatment plants at Achimota in northern Accra (with a capacity of 250 cubic metres per day) and Teshie/ Nungua (with a capacity of 80 cubic metres per day) in eastern Accra (Fobil, 2002:197). However, it only handled about 8% (with a capacity of 120 cubic metres per day) of Accra's wastewater (Adu-Ahyiah and Anku, 2008:2). According to Fobil (2002:194) many public facilities fell into long periods of misuse, abuse, and disrepair due to the closure of public lavatories and the disposal of human waste into the Odaw River which runs through

Accra City, resulting in high build-ups of sludge in septic tanks and open defecation. In 2000, the DFID funded the construction of sewerage treatment plants as part of the Accra Waste Project.

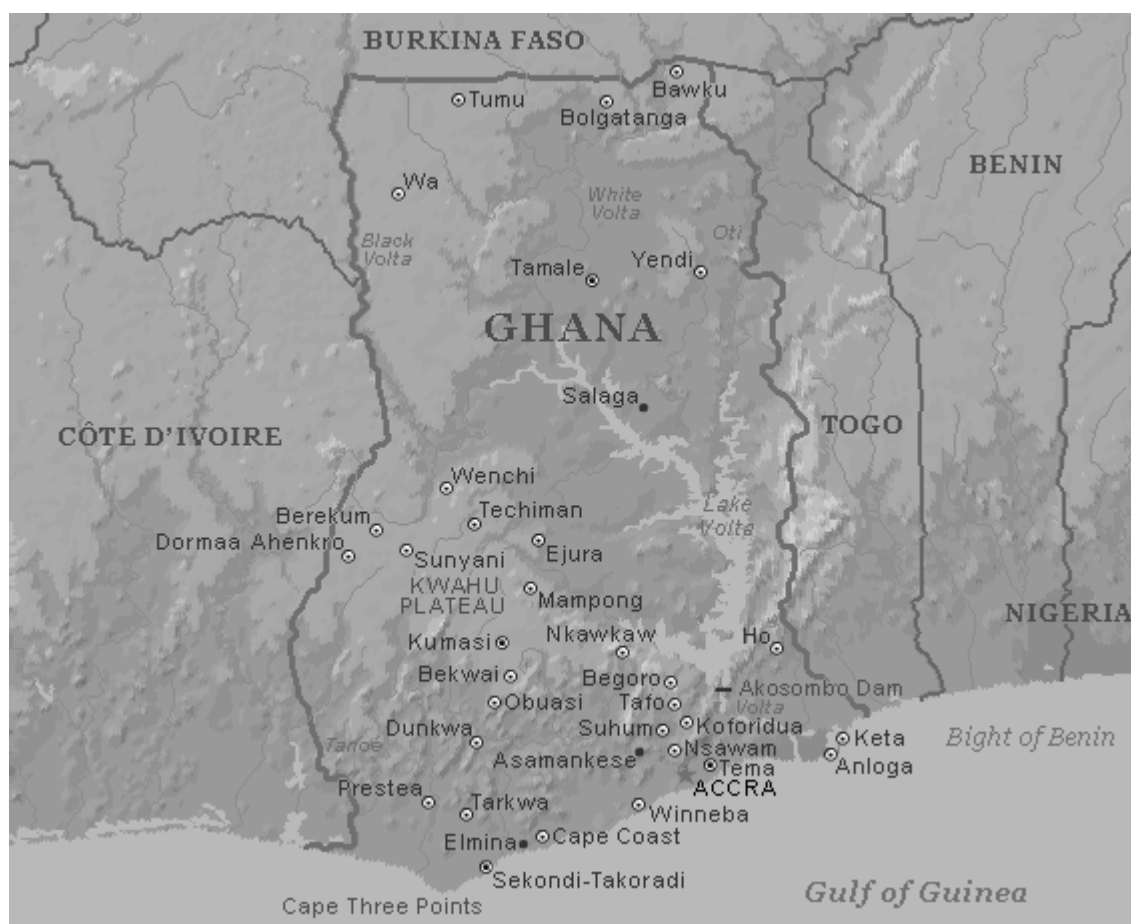
Sewerage treatment plants are rare, and many of those that exist are in need of repair or are inadequate for the amounts and kinds of materials they receive. Most treatment plants were only constructed to handle water-borne domestic sewage. Ghana is one of the few countries in the world with treatment plants designed to treat septage and night soil as well as water-borne sewage. Treated or untreated, most sewage ends up in streams and oceans (Showers, 2002:625). Streams of all types: perennial, intermittent, large and small have been contaminated by untreated domestic and industrial waste; ecological functions have been disrupted, and their ability to function as water suppliers is compromised (Showers, 2002:633).

As indicated in chapter 4, the vast majority of waste water treatment plants do not work, the two central sewer systems are not operational, and only four (Kotoko Airport, La Palm Royal Hotel, Labadi Beach Hotel, and Golden Tulip Hotel) of the 35 institutional and commercial treatment plants are functioning; wastewater is disposed into storm water drains. Adank et al (2011:57) point out that lack of management and technical skills amongst 97% of the 2000 employees of AMA and the fact that over 50% of the employees are unskilled, are the reasons why treatment facilities are breaking down and performing below capacity. This is exacerbated by a lack of safe and hygienic sanitation in Accra, together with lack of treatment capacity within AMA. When the African Development Bank, the government of Ghana and the Accra Metropolitan Assembly conceived the rehabilitation of sanitation infrastructures in 2006, the greatest challenge was to deal with the public health crisis because only 15% of households were served by piped waterborne sewerage networks and almost all waste water treatment plants were dysfunctional (Adank, et al, 2011:57).

The management of waste water treatment plants was devolved to AMA since 1999 and it is no longer the responsibility of GWCL as per implementation of IWRM. Results show

that AMA was not ready to render this function and seriously lacked the capacity hence WWTP's situation worsened despite funding from the AfDB to develop additional capacity. The regulation of wastewater discharge is the responsibility of the EPA which was established by Act 490 of 1994. The duties of EPA include ensuring that waste water disposal is done in accordance with the L1 1652 environmental assessment regulations of 1999. The EPA's role in the regulation of wastewater is poor when it comes to holding polluters accountable (Adank, et al, 2011:57).

Figure 5.4 Cities in Ghana



Source: <http://74.54.19.227/GHP/img/pics/12307026.gif> date accessed 29 Sept 2011

As indicated in chapter 4, GWCL continued to collect a 35% sewerage surcharge ('pay as you flush') on volume of water consumed in houses with sewer connections on a commission basis on behalf of AMA. The other source of income is charges levied on the

usage of public latrines (400 cedis in KVIP, 600 cedis in aqua privies and 1,000 cedis in water closets), and the emptying of septic tanks for about C450.000 per five square metre truck load. All of the above charges are meant to assist AMA in increasing access to sanitation, and capacity to manage waste water treatment plants, but the results show that there is very little improvement in either of these functions (Adank, et al, 2011: 57, Focus Group Discussions, 2010).

5.6.5 Water resources

Ghana is well endowed with water resources in the form of perennial rivers and groundwater although seasonal shortages are quite common. The country is drained by three main river systems; the Volta basin, the south-western basins, and the coastal basins river systems. The Volta River system basin, consisting of the Oti, Daka, Pru, Sene and Afram rivers as well as the White and Black Volta rivers, covers 70% of the country area. The Volta River system is shared with Cote d'Ivoire, Burkina Faso, Togo, Benin, and Mali. Another 22% of Ghana is covered by the south-western river system watershed comprising the Bia, Tano, Ankobra, and Pra rivers (Odame-Ababio, 2002:158). The Bia River is shared with Cote d'Ivoire, while the lower reaches of the Tano River form part of the boundary with Cote d'Ivoire. The coastal river system watershed, comprising the Ochi-Nawuka, Ochi Amissah, Ayensu, Densu, and Tordzi rivers, covers the remaining 8% of the country. The total annual run-off of the river basins is 56.4 billion cubic meters. The Volta, south-western and coastal systems contribute 73.7%, 29.2% and 6.1 %, respectively, of the annual runoff originating from Ghana (Ministry of Works and Housing, 1998, Odame-Ababio, 2002:158).

Furthermore, groundwater is available in mesozoic and cenozoic sedimentary rocks and in sedimentary formations underlying the Volta basin. According to Odame-Ababio (2002:158) the groundwater resources of the country are found in two main rock formations: 1) the sedimentary formation made up of mainly Voltaian origin which occupies about 43% of the total area of the country, and yields 1.0 to 12.0 cubic meters per hectare at depths of 20 to 80 meters and 2) the non-sedimentary formation made up mainly of a crystalline basement complex of pre-Cambrian origin which occupies 57% of

the total area of the country, and yields 1.5 to 32.0 cubic meters per hectare at depths of 20 to 100 meters. The Volta Lake, with a surface of 8,500 km², is one of the world's largest artificial lakes. In all, the total actual renewable water resources are estimated to be 53.2 billion m³ per year. One of the most important wetlands, the Keta Lagoon complex, is threatened by severe coastal erosion and flooding. Both problems have probably been compounded by the construction of a dam on the Volta River, inland from Keta. The dam has reduced the amount of sediment discharged into the sea which used to help build up the narrow beach to compensate for erosion caused by long shore drift. Proposals to mitigate these problems threaten the value of the Keta Lagoon complex as a wildlife habitat. The quality of groundwater resources in Ghana is generally good except for some cases of localised pollution with high levels of iron and fluoride, as well as high mineralisation with total dissolved solids, especially in some coastal aquifers (Turner, 1991:62, FAO, 2008:4, Odame-Ababio, 2002:159).

The above figures demonstrate that Ghana is not experiencing physical water scarcity, but institutional and economic scarcity. The availability of water resources has not assisted Ghana in improving water supply coverage in water supply. Sanitation, facility development, and management of waste water treatment plants intended to improve public health and prevent degradation of the environment in general and water resources in particular, remain a challenge (Focus Group Discussion, 2010). In 2000, total water withdrawal was 982 million m³, of which two thirds were used for agricultural purposes. Another 10% was withdrawn for industry, leaving 24% or 235 million m³ for domestic use. Furthermore, 37,843 km³ are used for hydroelectricity generation at the Akosombo Dam each year (FAO, 2008:5).

5.6.6 National water policy and environmental sanitation policy

To overcome the lack of coordination between the numerous institutions which have been created since 1993, the Minister of Housing and Public Works, Honourable Saddique, launched a National Water Policy (NWP) at the end of February 2008 which focuses on the three strategic areas: (i) water resource management (ii) urban water supply and (iii) community water and sanitation. As indicated in chapter 4 an environmental sanitation

policy was launched in 1999 by the Ministry of Local Government. The key target of the sanitation policy is 90% national coverage of acceptable domestic toilets by 2020, and 10% access to affordable public toilets (ADF, 2005:5). In this sector the Ministry of Housing and Public Works regulates water supply and water resources through the WRC, EPA, and PURC, and sanitation is regulated by the Ministry of Local Government. The AMA deals with two separate regulators in the sector as a result of IWRM and related donor funding conditions. The two ministries are required to provide support to local authorities in decentralised functions that are such as water resource management, water supply, and sanitation (ISODEC and Public Citizen, 2002:20).

Although the sector has made substantial progress, a lack of coherence in policy formulation has resulted in a multitude of implementation strategies which has led to new problems. The NWP thus aims to formulate a comprehensive sector policy which includes all the relevant actors in the sector. According to the minister, the NWP could make it easier for development partners to provide necessary support to the sector (WRC, 2008). The NWP has been prepared by the Ghanaian Water Resources Commission (WRC) since 2002, and is based on the Ghanaian Constitution of 1992, the Ghana Poverty Reduction Strategy (GPRS), international agreements and conventions, and other national programmes (WRC, 2008). Critics of the water policy acknowledge that it contains all the principles identified at recent international conferences on water. One of the weaknesses of implementing the water policy at all levels of government is lack of capacity building. Once trained, staff members often move into the private sector or to international NGOs (van Edig et al, 2007:36).

5.6.7 Responsibility for water supply and sanitation

According to a multi-donor review of Ghana's water supply sector, it is "quite well structured", with the government in charge of policy and regulation while the private sector and communities play important roles in service delivery (AMCOW, AfDB, EUWI, WSP and UNDP, 2006:27). The institutional framework for sanitation is much less clear with responsibilities also not clearly defined. The contradictions highlighted above are in line with the opinions of Petit and Baron (2009:51), namely that IWRM has

brought about demand management, a shift from supply-side management, advocating for the right price instead of the right institution, decentralised management, scarcity, recognition of water as an economic good, sustainability, catchment management, promotion of market-based instruments, privatisation of water, private sector efficiency, and government corruption. The separation of urban water and sanitation supply, and rural water and sanitation supply, water resources management by the Ghana Government reflects the IWRM's neo-liberal rubric. The result is a twisted form of decentralisation, excessive market orientation and cost recovery, and very little benefit to rural communities. A representative of CONIWAS noted: "The introduction of IWRM created institutional confusion in Ghana. We have more structures and organisations than water available in our taps" (Focus Group Discussions, 2010).

5.6.8 Policy and regulation

At the moment, a number of institutions exist to supervise and regulate water supply and sanitation. The entire policy framework is based on Ghana's Poverty Reduction Strategy (GPRS), the MDG's targets, and the government's coordination with donor assistance (Water Aid Ghana, 2005:29). This clearly indicates that IWRM is not the brainchild of the Ghana government, but a structural adjustment programme of the World Bank and Africa's own neoliberal prescription by the African Development Bank (Focus Group Discussion, 2010).

General water sector policies for both rural and urban areas are set by the water directorate in the Ministry of Water Resources, Works and Housing (MWRWH). Furthermore, the ministry solicits funding from external support agencies, monitors the sector, and advises the cabinet (Water Aid, 2008). The water sector restructuring secretariat, created in 1997 in the Ministry of Water Resources, Works and Housing, oversees the process of private sector participation in the sector (Doe, 2007:33).

"The motive for the institutional arrangements prescribed by multilateral institutions is not to increase access to water supply and sanitation in Rural Ghana, but to create

an enabling environment for private sector participation under the rubric of IWRM” (Member of Focus Group Discussion, 2010).

The Ministry of Local Government and Rural Development shares the responsibility for setting sanitation policies and coordinating funding for the subsector with MWRWH. The government promotes decentralisation so that sanitation policies are expected to be carried out by metropolitan, municipal, and district assemblies. To enforce environmental quality laws, the EPA under the Ministry of Environment and Science is expected to examine the impact of sanitation development activities on the environment. An official from the water and sanitation department within GA commented that:

“Accra Metropolitan Assembly lacks capacity and the financial resources to manage waste water treatment plants under its jurisdiction. Even the collection of Pay As You Flush (PAYF) tax from the 15% of the households that have water-borne sanitation is still done by GWCL due to lack of capacity.”

This is evidence that decentralisation is not working. A member from the CONIWAS secretariat added:

“The conditions that were put by the World Bank and further supported by the AfDB to separate water and sanitation supply, urban and rural supply, regulation and law enforcement are proved to be difficult to implement. The overlaps of roles and responsibilities, decentralisation that is not supported by fiscal decentralisation and lack of human resource capacity are the outcomes of the decentralisation imposed on the Government of Ghana by the “so-called donors” (Focus Group Discussion, 2010).

5.6.9 Service provision

The separation of institutions providing water in urban and rural areas in the form of GWCL and CWSA in the water sector and local authorities in rural and urban sanitation, is the AfDB’s by-product of manufactured scarcity in Africa. The implementation of

IWRM in Africa in general and in Ghana in particular has perpetuated water and sanitation scarcity, and driven the justification that people who are without Ghana cedis should be excluded from access to water and sanitation (Focus Group Discussion, 2010). The provision of water and sanitation is skewed in favour of urban areas which attract the private sector and very little is left for people in rural areas who are not willing or able to contribute 5% in the form of capital costs together with their rural DAs who are also expected to contribute the same prior to the implementation of projects (Fuest, 2005:61, Focus Group Discussions, 2010).

The GWCL is responsible for providing, distributing, and conserving water for domestic, public, and industrial purposes in 82 urban systems in localities with more than 5,000 inhabitants. Moreover, the company is mandated to establish, operate, and control sewerage systems in Ghana prior to handing them over to district assemblies as a result of decentralisation (CWSA, 2004:11). This arrangement has assisted the GWCL to maximise profits as part of the recognition of water as an economic good as per IWRM principles. If the GWCL were to continue to serve rural communities, their goal of profit maximisation would be more difficult to realise (Lund, 2007, Demanya, 2002:23). Local private companies are in charge of meter installations, customer billing, and revenue collection. The private operator AVRL has supported GWCL under a five-year management contract since October 2006 in the framework of the urban water project, in order to improve its performance and rehabilitate and extend its infrastructure (Water Aid Ghana, 2005:19). Urban sanitation is the responsibility of local governments. Private sector participation is criticised by ISODEC and the Public Citizen, (2002:7) as not addressing the much needed improvements in sanitation since it separated water from sanitation, and increased cost recovery and automatic tariff adjustments.

The CWSA is in charge of coordinating and facilitating the implementation of the National Community Water and Sanitation Programme (NCWSP) of the World Bank in rural areas which is carried out directly by the communities and their DAs. The NCWSP focuses on three main objectives in order to achieve health improvements: safe water supply, hygiene education, and improved sanitation (CWSA, 2004:15). The CWSA was

created in 1994 under the framework of the Ghana decentralisation policy and became autonomous in 1998. The institution does not directly construct, operate, and maintain utilities for water supply and sanitation. Instead, it coordinates the work of a number of actors including public sector organisations, local beneficiary communities, private sector organisations, and NGOs to carry out the services in rural areas. The CWSA is also expected to ensure that financial support from development partners is effectively used, and to provide rural areas and small towns with hygiene education. To carry out these tasks, the agency operates ten regional offices besides its head office in Accra (CWSA, 2004:9).

In communities with fewer than 50,000 inhabitants, water supply systems are owned and managed by the communities themselves on a demand-driven basis. According to the NCWSP, these systems do not receive any cross-subsidies and 5% of the cost of providing the facility is paid for by the operating community (Nyarko, 2004:218). Rural communities and small towns form gender-balanced voluntary groups which are represented by elected water and sanitation boards, including one or two village-based caretakers who receive special training in repair and maintenance (Komives, Akanbang, Thorsten, Tuffour, Wakeman, Larbi, Bakalian and Whittington, 2008:2). Communities and the CWSA are enabled to contract external actors such as private sector consultants or NGOs, to provide technical assistance, goods, or services (Water Aid Ghana, 2005:31). Local companies are regularly encouraged in the provision of boreholes and hand-dug wells, and local artisans are used to provide household latrines (Ibid, 2005:19). Although the communities' water and sanitation boards are expected to independently operate and maintain their water supply systems, they receive technical assistance from the district water and sanitation teams (DWST) at the district level, in the form of an engineer, a hygiene expert, and a community mobiliser (Komives, et al., 2008:2).

5.6.10 Rural water infrastructure

A CWSA official elaborated on the status of rural water infrastructures:

“The major drinking water facilities in the rural areas are hand-dug wells and boreholes. Hand-dug wells can be constructed by the communities themselves in the regions where the water table is high. These wells may or may not be lined and fitted with pumps. Other water source, are shallow wells, up to 3 metres deep, which are dug in low-lying areas of river banks in the dry season. Shallow wells often involve problems of pollution from free disposal of human and animal waste, household refuse, leaves etc. They also frequently dry up, especially during dry season.”

The major infrastructure investments for drinking water are boreholes which are drilled by machines and can be up to 50 metres in depth. Among the water sources in rural communities, borehole water appears to be the safest. The drilling of boreholes has decreased the dependency on less secure water sources, such as wells, streams, ponds, dug-outs, and dams and the harvesting of rain water (Birner, Schiffer, Asante, Gyasi and McCarthy, 2005:11). A member of CONIWAS is disappointed that: “A sophisticated middle income country such as Ghana is only able to provide shallow wells and boreholes to its inhabitants”.

5.6.11 Economic efficiency, tariffs and cost recovery

According to the Water Sector Restructuring Secretariat, non-revenue water in urban areas stands at approximately 50% of produced water, i.e. it is lost due to leakage and illegal connections (Water for Ghana, 2008). According to a Ghanaian radio station, a survey showed that 3,000 out of 15,000 connections were illegal while 20 minor leaks were found (Kessben FM, 2008). Furthermore, most of those connected to water supplies do not pay their bills (Abayie, 2008). At the end of the 1990s, the Ghanaian government participated in programmes meant to reduce the poor payment culture (Water Aid, 2006:4). As part of the efforts to reduce system losses the Accra eastern region of the AVRL-GWCL caused the arrest of ten illegal connection syndicates in the Adenta community in February 2008. They had constructed huge underground reservoirs which served as sources of water for private water tanker operators. The tanker operators bought water from the illegal sources and sold it to private individuals at Ashaley Botwe at high prices. It is estimated that in 2006, approximately 60 employees were responsible for

1,000 connections. This figure is extremely high compared both to international and regional levels (NEPAD and OECD, 2007). International good practice calls for less than four employees per 1,000 connections. Labour productivity is extremely low in rural areas (Adank, et al, 2011:50).

In this section the tariffs in urban and rural areas are compared and it is clear that rural households pay more for water and sanitation than their urban counterparts (AfDB, 2005:50). According to the AfDB (2005:50) water tariffs in Ghana are too low to recover the costs of the service. According to CONIWAS and DA officials, there is a gap between urban and rural tariffs:

“Water tariffs in rural areas tend to be higher than in urban areas. Households with water closets connected to the sewerage system have to pay a connection fee of 20 cedis, while commercial enterprises have to pay a connection fee of 50 cedis. Upon payment of the connection fee, an estimation of the installation costs is made based on the site plan. Installation costs are about 200 cedis for household connections and can be as high as 7000 cedis for the connection of a building like a bank” (Member of Focus Group Discussion, 2010).

A requirement for connection is that the person requesting the connection must hand over proof of ownership of the property to be connected which excludes tenants and people living in informal settlements from connecting to the sewerage system. A surcharge of 35% is added to the water charges for those with sewerage connections. In other parts of Ghana, such as Tema households, a connection to the sewerage network is a flat sewerage tariff of 6 cedis per person (Adank et al, 2011:61). An Accra City official elaborated:

“Households with private water closets connected to septic tanks pay a fee for collection of septic waste. The fee amounts to 52 cedis per 7000 litres of waste. A septic tank is emptied at least once in 5 years. Households using pan and bucket latrines pay 12 cedis per week as per 7000 litres of waste. For those with KVIPs,

they pay about 45 cedis to empty 7000 litres of waste. There were still about 5002 residences, 3 industrial, 243 hospitality joints and 46 schools using pan latrines in 2009.”

The above tariffs and a scarcity of land to build septic tanks are the reasons why most rural households in Accra have unimproved sanitation facilities (Adank et al, 2011:62). Between 1990 and 1997 the average water tariff in Ghana’s urban areas was in the range of US\$0.10 to US\$0.15 per m³. At that time, the government was not willing to approve major tariff increases. However, the situation changed with the creation of the regulatory agency PURC which autonomously examines and approves public service tariffs, resulting in an average water tariff of about US\$0.50 in 2004 (Water Aid, 2006:4). In 2006, GWCL’s tariff for the first 20m³ consumed was US\$0.55 per m³, whereas US\$0.76 was charged for each m³ exceeding 20m³ within a month. In 2010 the tariffs increased to cedis 0.66 for any consumption between 0 to 20 cubic metres for metered domestic users per cubic metre. Households with a consumption of above 20 cubic metres per month pay cedis 0.91 per cubic metre. Those using a metred public standpipe pay cedis 0.66 per cubic metre per month. Commercial, industrial, private and public institutions pay cedis 1.10 per cubic metre per month. Industries that consume a lot of water, such as Coca Cola and Nestle pay a special commercial rate of cedis 2.04 per cubic metre per month (Doe, 2007:32, Adank, et al, 2011:36).

According to the CWSA’s policy, the water tariff in rural areas should recover the supply cost of the service, including operation, maintenance, major repairs, replacements, and extensions to new areas. Tariffs are set by the DAs in rural areas (Water Aid, 2006:5). However, the supply cost should be low enough to not exceed a tariff of more than US\$1 per m³. A study conducted in five community-managed piped systems in the Ashanti region found an average tariff of about US\$0.60 per m³ in 2003, which actually covers between 57% and 77% of the full supply cost (Nyarko, et al., 2006:99). Another study carried out in 2005 indicates an average monthly expenditure for water of US\$0.99 in 97 sample villages in the Volta region and US\$0.89 in 103 villages in the Brong Ahafo region per household. However, in nearly 70% of the villages in Volta and only 40% of

the villages in Brong Ahafo, at least 90% of the interviewed households actually paid for water. Where water use is charged, it is done through a fixed system or a pay-as-you-fetch system. Water vendors tend to double the price of water, and in some instances they charge four to nine times the prices charged by the CWSA or GWCL. Prices are also based on the stratification of the community. High income earners pay 5.17 cedis per cubic metre, middle earners pay 5.3 cedis per cubic metres, whereas low income paid 7.2 cedis per cubic metre. Poor households in rural areas paid more for water obtained through tanker services than their wealthy urban counterparts (Komives, et al., 2008:4, Adank, et al, 2011:39).

5.6.12. Investment and financing

Since economic efficiency as well as cost recovery in the sector are extremely low, financing water and sanitation investments in Ghana relies heavily on external funding. According to one estimate 90% of the total investment in the sector in the 1990s was made by external agencies (ADF, 2005:6) which contributed about US\$500 million to the sector between 1990 and 2003. It is worth mentioning that sanitation generally receives much less attention (Water Aid, 2006:3) According to another estimate, more than 96% of the expected financing in 2006 and in future will be from external donors (AMCOW, et al., 2006:27).

Despite the strong engagement of international donors, access to funding remains insufficient to achieve the MDGs for water and sanitation. The MGDs aim at halving the share of the population without access to these services by 2015. According to one estimate, the expansion and rehabilitation of urban infrastructures requires investments of US\$1.3 billion over an unspecified period (African Economic Outlook, 2007:294). Expected investment funding for 2006 was US\$ 85 million, or 57% of the country's needs that year (AMCOW, et al., 2006:27). Actual annual investments in urban areas have been estimated by the Water Sector Restructuring Secretariat to be around US\$40 million per year, having "recently" decreased to only US\$17 million per year by 2011. The US\$40m figure for urban areas corresponds to about US\$4 per capita, about the same as other low-income countries (Water for Ghana, 2008).

5.7 Conclusion

The implementation of IWRM in Ghana has resulted in water and sanitation scarcity. The institutions charged with the responsibility of implementing IWRM in Ghana pay lip service to local context and more attention to the privatisation, commercialisation, and community management of urban and rural water supply and sanitation respectively. Sanitation provision and waste water treatment management has been devolved to district and local assemblies which are not sufficiently prepared to discharge such responsibilities. Sustainable water and sanitation provision has become a pipe-dream in a sector dominated by water vendors charging double the price for water and sanitation services than public providers such as the GWCL and CWSA. PURC which is charged with the regulation of prices has done nothing to stop the booming water vending market created by the implementation of IWRM without taking the local context into consideration. The election of various pro-business governments in Ghana intensified the drive to ‘manufacture’ water and sanitation scarcity, especially in rural areas. Instead of practising integrated management of water resources, institutions such as the EPA and WRC tend to duplicate each other’s efforts, and render IWRM implementation unworkable.

On paper, Ghana has established the institutions required for the implementation of IWRM. But in practice the structures, institutions, constitutions, transaction and information costs, and formal and informal rules of the game have shifted scarcity from physical scarcity into an institutional, governance and market-related context. The rural households in Ghana lack access to water supply and sanitation services not because there is a lack of water as a natural resource but because of the institutional and constitutional choices made by government in implementing IWRM which have exacerbated rural water and sanitation scarcity. The next chapter presents the institutional mechanisms adopted in Malawi as a result of the adoption of IWRM.

Chapter Six

Malawi's boreholes, drought and community-managed pit-latrines

6.1 Introduction

This chapter explores how the commodification of boreholes and unhygienic pit latrines had undermined the good intentions of the government to ensure “water for all, always”. The chapter further investigates how unplanned decentralisation had backfired on weak local and district assemblies and public utilities, and rendered IWRM principles and practices worthless. The challenges facing the implementation of IWRM are evidenced by the drilling of more boreholes which had resulted in drought and the outbreak of water-borne diseases in Malawi (Mkandawire, Mulwafu, Chipofya, Bota and Kainja, 2011:1).

Malawi is endowed with a variety of natural resources which include several expanses of water systems and is generally considered to be relatively rich in water resources in the form of lakes, rivers, and aquifers (FAO, 2007). Total renewable water resources are estimated at 30 cubic kilometres per year. There are renewable freshwater resources of about 3,000 cubic meters per capita per year, but the distribution across the country is irregular and varies by season and year (Ng'ongo'la, 1999:9, Ferguson and Mulwafu, 2004:3). Various institutions are responsible for water resources allocations, regulation, policy implementation and provision to users. The roles of each of the agencies are outlined in the Water Policy of 2005, the Water Resources Act of 1969, and the National Sanitation Policy of 2007 (Chipofya, Kainja and Bota, 2010:261).

This chapter investigates water and sanitation backlogs and the fact that Malawi is off-track in meeting water and sanitation MDGs despite the fact that it is generously endowed with water resources and plays host to one of the third largest lakes in Africa and the eleventh largest in the world, Lake Malawi. However the mass use of boreholes for water provision in rural and peri-urban areas; un-improved and unhygienic pit latrines in both urban and rural areas in the context of water and sanitation management vision; the lack of financing the sector by government and donor agencies; and the availability of

progressive policies that are not translated into an increase of water and sanitation coverage; has led to waterborne diseases killing people even in the commercial city of Blantyre. Obstacles to the provision of safe water and adequate sanitation include weak leadership in the sector, poor sustainability of services, allocation of water points to local communities based on political affiliation rather than need, and limited capacity in the sector. These are just some of the issues that shape the arguments about a country which has abundant water resources yet consistently experiences water shortages (Ferguson and Mulwafu, 2004:3, Chipofya, et al, 2010:262, Mkandawire, et al. 2011:1, Welle, 2005:9).

The chapter presents the status of water resources in Malawi, sources of water, rainfall patterns, storage facilities, and policies and legislation that govern water resource allocation. Malawi is endowed with large water resources such as Lakes Malawi, Malombe, Chilwa, and Chiuta, and water storage facilities in the form of nine major dams with a height of more than 12m and a total storage of slightly over 43 million m³ (FAO, 2007). In addition there are 700-750 small dams with a storage capacity of approximately 64 million m³, most of which were built during the colonial period and are in various states of disrepair. Malawi is rich in wetlands, which includes lakes, rivers, reservoirs spread all over the country, and marshes. When the UDF government took over in 1994, there were about 9,600 boreholes and 5,600 protected shallow wells, the majority of which were constructed by the government of Dr. Kamuzu Hastings Banda. Dr. Banda's government discouraged the use of boreholes and shallow wells and promoted the use of tap water and flush toilets (Ng'ong'ola, 1999: 8, Ferguson and Mulwafu, 2004: 3, Mkandawire, et. al, 2011:7, Welle, 2005:11).

The Ministry of Water Development (2001) indicated that by 2001 there were about 19,000 boreholes. This resulted in a proliferation of drilling contractors in the country. Boreholes are even drilled on the outskirts of the commercial city, Blantyre. The number of shallow wells had decreased as a result of drought and this has further increased the demand for boreholes. The challenges that the country is facing, according to the Ministry of Irrigation and Water Development (2005:1), are a lack of regulation and

proper management of shallow wells and boreholes, combined with the intensity and bad methods of utilisation of water resources which result in their depletion.

One of the key strategies highlighted in the PRSP (2002) regarding increasing accessibility to good drinking water and sanitation includes construction and rehabilitation of water facilities, increasing capacity to meet demand from industry and domestic users, conservation and management of water resources and reduction on incidences of waterborne diseases. The activities proposed included construction and rehabilitation of boreholes and piped water schemes, training communities in the maintenance of boreholes, piloting groundwater storage gravity supply schemes, institute monitoring and evaluation, building professional capacity in MOWD, implementing water loss reduction measures, enhancing cost recovery measures, strengthening the viability of water supplies, improving operational autonomy and commercial viability of water boards, construction and rehabilitation of small multi-purpose dams, community mobilisation and training in environmental and water catchment protection, rehabilitation of water catchment areas, strengthen institutional capacity to collect hydrological, hydrogeological and water quality data, developing water resources policy, introducing ventilated improved pit latrines and conducting sanitation awareness campaigns (Malawi Government, 2002:13, Malawi Poverty Reduction Strategy Paper 2002:42).

The other challenge is that, although the country is endowed with vast amount of water resources, it is currently encountering a number of growing competing demands and challenges. The focus of the government in the PRSP is on constructing boreholes and VIP latrines, and ensuring cost recovery and the viability of water boards. Some of these demands and challenges are exacerbated by the high population growth, resulting in an increase in demand for water for domestic, industrial, and municipal uses, agriculture and irrigation, tourism, mining, manufacturing, water transport or navigation, energy or hydropower, and ecological sustenance (Mkandawire, et. al, 2011:6).

Malawi is one of many African States that have not met the WSSD deadline of adopting the IWRM policy by 2005. Steps are being taken to align national water and sanitation

policies to the principles of IWRM. Decentralisation has taken place without budgets and the necessary structural capacity to manage water resources. In the 2005 financial year, there was neither an indicator nor a target for decentralisation in the PRSP, yet it was allocated 81118MK, which was much lower than the 2002/ 3 financial year (Welle, 2005:5).

The key focus of decentralisation was to commercialise and privatise para-statal, review structures and functions of state enterprises, commercialise and privatise utility companies and water boards, build capacity of assembly personnel in financial management, develop human resource capacity for assemblies and below, strengthen national coordination of decentralisation, develop a phased implementation of system for intergovernmental transfers, strengthen revenue collection and management by assemblies, facilitate preparation and implementation of sector devolution plans, train assembly finance committees and accounting personnel, review by-laws, produce material and conduct civic education, provide support and training to media, traditional leaders and civil society institutions (Malawi Government, 2002:34).

The decentralisation of water and a sustainable development sector also involved updating the National Environmental Policy and the Environmental Management Act to decentralise environment management to the lowest appropriate level. This took the form of catchment management agencies and the establishment of environmental protection branches in local and district assemblies. Many of the catchment management agencies established to support district and local assemblies and water user associations however lack capacity among themselves, let alone when they act as water service authorities. The National Water Resources Authority is ineffective in determining and collecting fees related to water abstractions and discharge and to proper management of resources buffer zones, in declaring water catchments as water controlled areas, in controlling and apportioning water use in the country, and in issuing abstraction and discharge licenses. Five water boards are charged with the responsibility of promoting private sector participation in the delivery of water supply and sanitation services. But a neoliberal approach to water supply and sanitation provision is responsible for the poor water

quality and supply shortages. Instead of strengthening the capacity of local and district assemblies in water and sanitation provision, the five water boards are preoccupied with enticing the private sector and commercialising operations, rather than strengthening the public sector capacity to deliver adequate water from sources other than boreholes and shallow wells (Ferguson and Mulwafu, 2004:3, Chipofya, et. al, 2010:262, Mkandawire, et. al, 2011:1, Lopez, et. al, 2008:7, Malawi Government, 2002:39, Welle, 2005:5).

The management of community-based water services in the rural areas in terms of planning, maintenance, operations, and implementation is driven by NGOs. There are no national guidelines on how communities can manage their rural water supply systems, community dams, and catchment protection. Communities are expected to play a pivotal role in tap committees, borehole management, the establishment of structures, and digging shallow wells. NGOs are expected to provide investments for rural water supplies and community dam building and maintenance in accordance with the prevailing government policies and guidelines. Written guidelines are still envisaged in the draft Water Policy of 2005 as the Water Resources Act of 1969 is silent on how to deal with the provision of water and sanitation in rural areas, although the Water Works Act of 1995 had created a framework for water supply and sanitation delivery. In 2012 a Draft Water Resources Amendment Bill presented in parliament was rejected because MPs confused the role of water boards and the water resources authority, as proposed in the new legislation. MPs, including the late President Bingu wa Mutharika, were concerned about establishing too many water institutions within the IWRM framework (Chipofya, et. al, 2010:262, Chunga, 2012). If water and sanitation policies which are still in a draft form are promulgated into legislation, guidelines will be developed for the implementation of such policies. In the absence of proper guidelines and policy perspectives, the Ministry of Water Development is responsible for facilitation of the development and management of water resources in the country, ensuring access to safe water and related sanitation services, the provision of safe drinking water to rural communities, the collection of hydrological data, and catchment protection. In terms of the 1998 Decentralisation Act, these duties are meant to be devolved to district and local assemblies and to the envisaged Mpira Water Authority which in turn was established to

manage the Mpira Balaka water scheme as well as the reticulation of water to the Tcheu, Mangochi and Balaka rural areas (Chipofya, et, al, 2010:262, Mkandawire, et. al, 2011:8, Welle, 2005:11).

It is estimated that 90% of the budget of the Ministry of Water Development comes from donor agencies, despite the fact that water is a top priority in the Poverty Reduction Strategy Paper (PRSP) of Malawi. By 2005 the main donors who funded water and sanitation projects were the African Development Bank, UNICEF, CIDA, JICA, Water-Aid, GITEC, Emmanuel, Inter Aide, COMWASH and ECHO. The NGO implementing agents include the Church of Central Africa Presbyterian, Mataferia Consulting, the Water Supply and Sanitation Collaborative Council, Inter Aide, GITEC, Water Aid, Emmanuel, Concern Universal, World Vision, COMWASH, and Oxfam (Welle, 2005:15). As IWRM was implemented in Malawi, funding allocated by these agencies to increase accessibility to drinking water and sanitation in rural areas was substantial: 1,066.28, 1,067.64, 1,076.70 Million Malawi kwachas were projected annually from 2002-04 (Malawi Government, 2002:46).

The draft National Sanitation Policy makes provision for the creation of appropriate sanitary facilities and safe hygiene practices which are promoted at all public gatherings. To date, there are no documents that guide water boards, local government and other stakeholders about what constitutes appropriate sanitary facilities. Other gaps in policy and regulations include whether the ventilated improved pit latrines (VIPs) also fit in the definition of adequate sanitation or whether they are an improvement on open defecation, common in both urban and rural areas of Malawi. Other challenges are how to provide adequate sanitation and promote hygiene practices when water is provided through boreholes and shallow wells, and how to improve hygiene if even tap water is contaminated with the e-coli bacteria that cause typhoid and cholera in Blantyre (Water Aid, 2005, Welle, 2005:11).

Figure 6.1 Map of Malawi



Source: <http://www.nationsonline.org/oneworld/map/malawi-administrative-map.htm>

date accessed 29 September 2011

6.2 The state of water resources and provision of water supply and sanitation

6.2.1 Geography, climate and population

Malawi is a landlocked country, lying in southern Africa between latitudes 9°22'S and 17°03'S and longitudes of 33°40'E and 35°55'E. It is bordered by the United Republic of Tanzania to the north and northeast, Mozambique to the east, south and southwest, and Zambia to the west. The country has a total area of 118,480 square kilometres (km²) with a total length of about 900 kilometres (km) and a maximum width of about 250 km. About 20% of its total area is covered by surface water bodies (Ng'ong'ola, 1999:10, Mkandawire, et. al, 2011:7, World Bank, 2007a:1, NSO, 2009: 2).

In 2004, Malawi's population was about 12.3 million with an annual growth rate of 2.1% (2004); there was a 32% increase from 1998 to 2008 and an annual growth rate of 2.8% in 2008 (NSO, 2008:4). In 2008 the total population increased to 13,066,320: out of this 6,365,771 or 49% were males and 6,700,549 or 51% are females. About 83% of the total population was rural. Malawi is the most densely populated country in the SADC region with a population density of 104 inhabitants per km². The population is not evenly distributed throughout the country; and the southern region has the highest population densities in the country.

In 2002, 96% of the urban population and 62% of the rural population were using improved drinking water sources. The proportion of households with safe drinking water in urban areas remained constant at 80%, as was the case in 2008. However, in rural areas the claim for safe water supply increased from 69% in 2005 to 78% in 2009. The water supply project that catered for thousands of households in 1994 is expected to cater for over 1.5 million inhabitants in coming decades (Welle, 2005:11, National Statistical Office, 2008:2, NSO, 2009: 2). But the assumption in all such projections is that IWRM is working well in one of Africa's poorest countries.

The population figures in Ntcheu, Mangochi, and Balaka where the study was conducted are as follows, according to the latest census available:

Table 6.1 Population of Ntcheu, Mangochi and Balaka

Region and District	Total	Male	Female
Ntcheu	474,464	226,567	247,897
Mangochi	803,602	387,072	416,530
Balaka	316,748	151,637	165,111

Source: NSO, 2008:3

Though Malawi's fertility rate of 6.7 births per woman in the period 1990-1992 dropped to 6.3 births per woman in 1998-2000, it still remains one of the highest in the world. This high rate is attributed to early marriages, early-age pregnancies, relatively short birth intervals, and persistently poor knowledge of and access to modern contraceptive practices (World Bank, 2007:1, UNDP, 2008). This has left a particularly youthful population.

Table 6.2 Population distribution in Ntcheu

District/TA	Total	Male	Female	Total 18+	Male 18+	Female 18+
Ntcheu	474,464	226,567	247,897	227,134	103,440	123,694
Phambala	55,168	26,636	28,534	26,336	12,194	14,142
Mpando	50,528	24,726	25,802	22,816	10,566	12,250
Kwataine	41,338	19,594	21,744	20,528	9,172	11,356
S/C Makwangala	85,173	40,248	44,925	41,029	18,320	22,709
S/C Champiti	15,790	7,668	8,122	7,670	3,583	4,087
Njolomole	54,527	25,541	28,986	26,768	11,774	14,994
Chakhumbira	25,659	12,141	13,518	12,458	5,521	6,937
S/C Goodson Ganya	106,910	50,831	56,079	49,972	22,610	27,362
Masasa	24,691	11,865	12,826	11,789	5,421	6,268
Ntcheu Boma	14,680	7,319	7,361	7,868	4,279	3,589

Source: NSO, 2008:24

Table 6.3 Population distribution of Mangochi

District/TA/ Town	Total	Male	Female	Total 18+	Male 18+	Female 18+
Mangochi	803,602	387,072	416,530	370,500	170,248	200,252
Mponda	109,399	52,960	56,439	50,994	23,708	27,286
Chimwala	109,261	52,796	56,465	49,233	22,663	26,570
Nankumba	121,328	60,295	61,033	56,214	27,552	28,662
Jalasi	74,616	35,017	39,599	34,691	15,163	19,528
S/C M'bwana Nyambi	81,296	39,117	42,179	36,506	16,577	19,929
S/C Chowe	110,230	52,389	57,841	50,407	22,571	27,836
Katuli	52,424	24,820	27,604	24,916	10,999	13,917
Makanjila	68,396	32,623	35,773	31,345	14,138	17,207
S/C Namabvi	31,111	14,771	16,340	14,322	6,210	8,112
Lake Malawi National Park	233	102	131	106	50	56
Mangochi Town	39,369	19,339	20,030	19,073	9,399	9,674
Monkey Bay Urban	5,939	2,843	3,096	2,693	1,218	1,475

Source: NSO, 2008:25

Table 6.4 Population distribution of Balaka

District and TA/ Town	Total	Male	Female	Total 18+	Male 18+	Female 18+
Balaka	316,748	151,637	165,111	147,195	67,283	79,912
Nsamala	173,399	83,159	90,240	80,597	36,947	43,650
Kalemebo	121,246	57,623	63,623	55,396	24,721	30,675
Balaka Boma	22,103	10,855	11,248	11,202	5,615	5,587

Source: NSO, 2008:29

Malawi is one of the poorest countries in the world. Its human development index (HDI) of 0.464 ranked the country 166th out of 174 countries in 2000. In 2005, over 52.4% of the rural population lived below the poverty line. As many as 2.7 million Malawians (22%) live in dire poverty (ultra-poor). About 65% of the population consumes less than

1,500 calories per day, compared to the average daily recommended requirement of 2,200 calories (World Bank, 2007a:1)

The rapid increase in the population has resulted in greater pressure on land. Fallow periods for restoring soil fertility have been greatly reduced greatly in the smallholder farming systems, and cultivation is expanding to marginal and less fertile areas. This is leading to severe deforestation, soil erosion, and a general degradation of the natural resource base. The problem is more serious in southern Malawi than in central and northern Malawi (Ng'ong'ola, 1999:10, World Bank, 2007a:2). Government survey results show that the country's poverty levels declined marginally between 2005 and 2011 and the poorest continue to get poorer. The Integrated Household Survey released on 9 August 2012 by the Ministry of Economic Planning and Development and the national statistics office indicates that poverty declined slightly from 52.4% to 50.7%. The survey further shows that 24% of the population is now under extreme poverty, with 28% of the poorest living in rural areas.

Announcing the results, the then Minister of Planning and Development Atupele Muluzi, MP, described the poverty drop as unimpressive (Matonga, 2012a). "The economy was growing but it was not impacting on the poor. There was an improvement but quite insignificant. It shows our growth has been non-inclusive. It does cause concern, the poor got poorer while the rich got richer. The gap between rich over the poor has widened".

The minister said the results indicate that the country needs to increase its efforts to tackle poverty. Muluzi said the IHS provides an understanding of the living and welfare conditions of the population. The former deputy Minister of Health Mrs. Halima Daudi encountered appalling conditions in public health facilities when she visited the Ntcheu and Balaka district hospitals on 10th August 2012. To illustrate the poverty levels and lack of healthcare facilities relevant to health and hygiene promotion: a pregnant- women gave birth in the toilet while the deputy minister was paying a visit to the health centres due to a shortage of beds, according to the Malawi Broadcasting Corporation evening news bulletin. Funny Chuneke, the HIV/AIDS coordinator for the Mangochi District Council estimated the HIV/AIDs prevalence among fishermen and commercial sex

workers to have increased to 21%. This illustrates the contradictions in economic growth; poverty and the collapse of the public health system continue to persist (Matonga, 2012b, Malawi Broadcasting Corporation, 10 August 2012).

6.2.2 Water resources and use

6.2.2.1 Water resources

Malawi is endowed with a variety of natural resources which include expanses of water systems (MIWD, 2005:1, Mkandawire, et. al, 2011:7) and is generally considered to be relatively rich in water resources in the form of lakes, rivers, and aquifers (Ng'ong'ola, 1999:8, Ferguson and Mulwafu, 2004:3, FAO, 2007, Mkandawire, et. al, 2011:8). The country is divided into 17 water resource areas (WRAs), which are subdivided into 78 water resource units (WRUs) (Ferguson and Mulwafu, 2004:12, MIWD, 2004:22, see also Table 6.5). There are two major drainage systems:

The Lake Malawi system which is part of the Zambezi River basin, is the main surface water source. The Shire River is the only outlet of the lake with an average flow of 400 cubic metres per second (m^3/s). About 91% of the country is located in the Zambezi River basin (Ng'ong'ola, 1999: 9, Ferguson and Mulwafu, 2004:3).

The Lake Chilwa system which is shared with Mozambique, is another huge lake and is an endorheic basin draining rivers originating from the eastern slopes of the Shire Highlands, the Zomba Plateau and the northern slopes of the Mulanje Massif (Ng'ong'ola, 1999:9, Mulwafu, et. al, 2002:2, Mkandawire, et. al, 2011:9). These water systems cover 21% of the country's territorial area. There are also widespread groundwater sources associated with two aquifers, the basement complex aquifers which are extensive but low yielding (from 0.2 to 4 litres per second) and cover the plateau areas, namely the Shire Highlands, the Upper Shire Valley, Lilongwe to Kasungu Plain, and the South Rukuru River catchment (MIWD, 2005:1, Ng'ong'ola, 1999:9, Mulwafu, et. al, 2002:2, Ferguson and Mulwafu, 2004: 3, Mkandawire, et. al, 2011:8).

There are two main aquifers in Malawi. First, the Precambrian weathered basement complex is extensive but low yielding (up to 2 litres per second (L/s) is one of the aquifers. According to Ng'ong'ola (1999:9) the basement aquifers are discontinuous but widely distributed throughout the extensive pre-Cambrian basement gneiss complex formations which make up approximately 85% of Malawi's geology. The aquifers can yield up to 2 litres per second and are found in the weathered or fracture zones of the basement complex. The quality of groundwater in the weathered basement complex aquifer is generally acceptable, although localised groundwater quality problems occur due to high concentrations of salts. The second cluster is the quaternary alluvial aquifers in the lakeshore plains and the Lower Shire valley which are high yielding (up to 20 L/s) and regarded as a good water resource. The alluvial aquifers are also high yielding with recorded yields in excess of 10 litres per second. In the alluvial aquifer, groundwater is more mineralised. The main agents affecting groundwater are iron, fluoride, sulphate, nitrate, chloride, and total dissolved solids (FAO, 2007, Ng'ong'ola, 1999:9, Mulwafu, et. al, 2002:2, Ferguson and Mulwafu, 2004: 3, Mkandawire, et. al, 2011:7).

Malawi's total renewable water resources are estimated at 17.28 30 cubic kilometres per year (km^3/yr) (Ferguson and Mulwafu, 2004: 3). From this, 16.14 km^3 per year are produced internally, while about 1 km^3 per year comes from Mozambique via the Ruo River and 0.14 km^3 per year from a lake shared with Mozambique along the course of the Shire River. Almost all of the internal groundwater resources of $1.4 \text{ km}^3/\text{year}$ are thought to be drained by the rivers, as Malawi is a humid enclosed country. Water resource distribution is highly variable both seasonally and geographically, as nearly 90% of the run-off in major rivers occurs between December and June (Ng'ongo'la, 1999:9, Mulwafu, et. al, 2002: 2, MIWD, 2004:22, Mkandawire, et. al, 2011:9).

Lakes are a dominant feature of Malawi's water resources. Lake Malawi, the third largest freshwater lake in Africa and the eleventh largest in the world, has a total surface area of $28,760 \text{ km}^2$ (including the part of the lake belonging to Mozambique). The lake is 570 km long, 16 to 80 km wide, and has a total storage of $1,000 \text{ km}^3$. Its average depth is 426 m, and its maximum depth 700 m. It is the country's single most important water resource

and plays a vital role in the socio-economic development of the country (MIWD, 2005:1, FAO, 2007). Lake Malawi is the world's cleanest lake, inhabited by more species of fish than Europe and North America combined (Mulwafu, et. al, 2002:2, Water Aid, 2005:4). However, the lake is in the bottom of the Rift Valley while most Malawians live up on the plateaux. That means the water is almost unusable for agriculture and hydropower development (Ng'ong'ola, 1999:9, Ferguson and Mulwafu, 2004: 3).

Lake Malombe covers 303 km², is about 30 km long, 15 km wide and has an average depth of 4 metres. It is an inflation of the Shire River which forms part of the great East African Rift Valley (Ng'ong'ola, 1999:9, Ferguson and Mulwafu, 2004: 3). Lake Chilwa lies on the border between Malawi and Mozambique. Being the sink of an endorheic basin, its surface area is very variable but is on average 683 km², of which 721 km² lies in Malawi. It is a shallow saline lake with an average depth of 2 metres (Ng'ong'ola, 1999:9, Mulwafu, et. al, 2002:2). Lake Chiuta, separated from Lake Chilwa by a sand bar of 20-25 metres in height, lies on the border between Malawi and Mozambique. It covers 200 km² of which 40 km² belong to Mozambique. Its depth is 5 metres (Mulwafu, et. al, 2002:2, Mkandawire, et. al, 2011:9).

There are nine major dams with a height of more than 12 metres with a total storage of slightly over 43 million m³. They have been constructed mainly for municipal water supplies, except for two that were constructed in the 1950s near Blantyre for hydroelectric purposes. In addition there are 700-750 small dams with a storage capacity of approximately 64 million m³, most of which were built during the colonial period and are in various states of disrepair; 60% of which are found in the South Rukuru and Ruo River basins. The known large dams are the Lunyangwa Dam situated in Mzuzu, the Chitete Dam in Kasungu, the Kamazu 1 in Lilongwe, the Kamazu II in Malingunde, Lilongwe, the Mpira Dam in Ntcheu, the Mulunguzi Dam in Zomba, and the Mudi Dam in Blantyre. Most of the large dams are earth-fill with only one rock-fill and constructed for water supply and irrigation. The Mpira-Balaka Dam has a capacity of 3072 million cubic meters occupying 42 kilometre square of catchment area and is 29 metres high (MIWD, 2004:22, 32, Ng'ong'ola, 1999:11, Mkandawire, et. al, 2011:9).

Due to lack of maintenance over a long period, most of these small dams require major rehabilitation. Most of them were built without compliance to engineering standards and specifications, environmental concerns, and stakeholder participation. No EIAs were conducted, safety engineering standards were not complied with, and no dam development policy was followed (even water conservation and flood mitigation strategies were not followed). Currently the government has embarked on the rehabilitation of some of these small dams through various programmes as part of the national water conservation strategy. According to the water resources board, any dam with a dam height of 4.5 metres and above is classified as a large dam; for that reason, dam design reports and drawings have to be available for technical consideration when water rights applications are processed. Malawi depends heavily on run-of-the-river water, whether the use is for hydropower, irrigation, water supply, or navigation. There are still very few multi-purpose water storage infrastructure schemes (Ng'ong'ola, 1999:11, MIWD, 2004: 22, Mkandawire, et. al, 2011:9).

Malawi is rich in wetlands, which includes lakes, rivers, many reservoirs spread over the country, and marshes. The most important marshes are the Elephant and Ndindi marshes in the Lower Shire Valley, the Vwaza Marsh in the Rumphi district, and the Chia Lagoon in Nkhosha. The major wetlands of Lake Malawi and Lake Chilwa are closely monitored under the RAMSAR and UN biodiversity conventions (Mkandawire, et. al, 2011:8).

The history of groundwater development in Malawi dates back as far as the early 1930s. By 1994, there were about 9,600 boreholes and 5,600 protected shallow wells, and 56 rural gravity piped water supply schemes, of which the majority were constructed, operated and maintained by the government. However, since then the increase in boreholes drilled by the government, non-governmental organisations, and the private sector has been dramatic, (according to the Ministry of Water Development there were about 19,000 boreholes drilled in 2001). DeGabriele (2002:2) estimated the total number of boreholes drilled by 2002 to be 20,000, and pointed out that the Ministry of Water

Development has been unable to regulate borehole drilling and drilling regulations was lifted in 1980s to respond to Mozambican refugee crisis. This trend is continuing and the number of boreholes is continually increasing as a result of the proliferation of drilling contractors in the country. Furthermore, due to the recent frequent occurrence of droughts, the number of hand-dug shallow wells has considerably decreased because they are highly vulnerable and prone to drying up, and therefore people have opted for boreholes instead of shallow wells (Ng'ong'ola, 1999: 12, Chipofya, et. al, 2010: 263, Ferguson and Mulwafu, 2004, 4, Welle, 2005:11).

Table 6.5 Distribution of dams per river basin

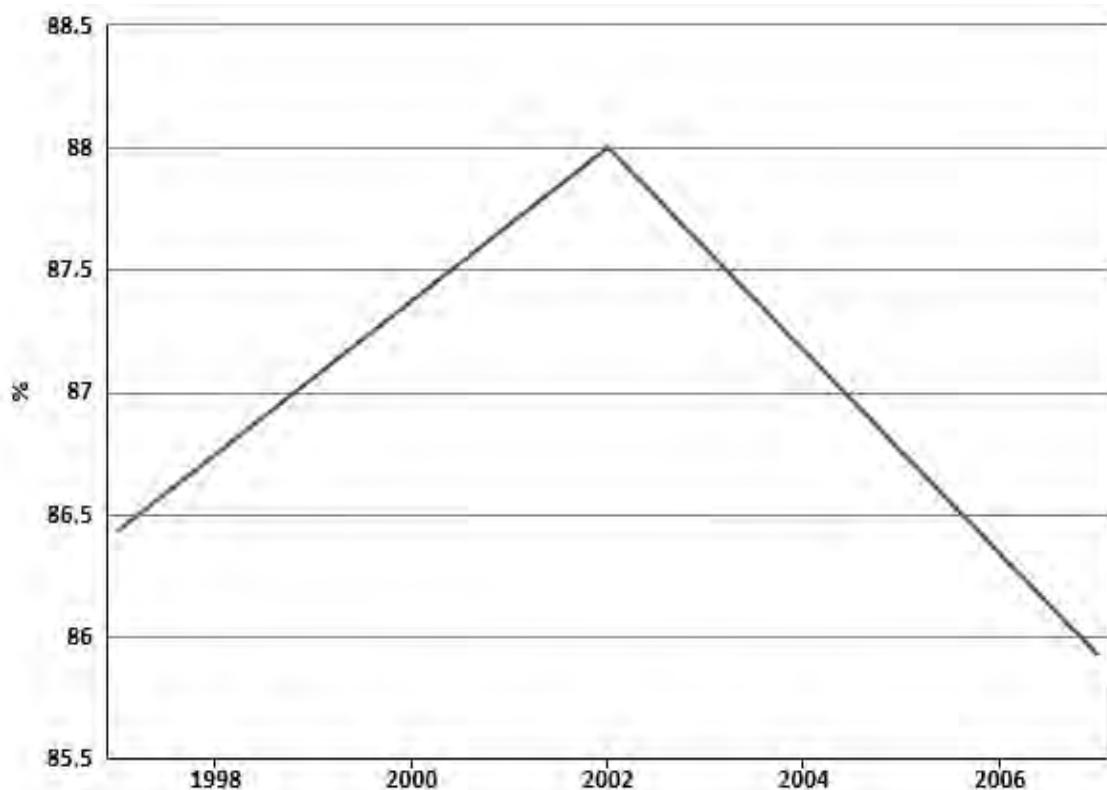
Water Resource Area	No. of Dams	Location
Shire	62	Blantyre
Lake Chilwa	31	Thondwe/Namadzi
South West Lakeshore	8	South West Lakeshore
Linthipe	33	Linthipe
Bua	38	Bua
Dwangwa	50	Dwangwa
South Rukuru/North Rumphu	274	South Rukuru/North Rumphu
North Rukuru	2	North Rukuru
Songwe/Lufira	3	Songwe/Lufira (Border with Tanzania)
South East Lakeshore	1	South East Lakeshore
Lake Chiuta	2	Border of Malawi and Mozambique
Likoma Island	0	Lokoma Island
Chizumulu Island	0	Chizumulu Island
Ruo	215	Ruo River basin
Nkhotakota Lakeshore	9	Nkhotakota
Nkhata Bay Lakeshore	21	Luweya/Limpasa area
Kazonga Lakeshore	0	Kazonga
Total 17 Catchment Areas	749 Dams	

Source: Ministry of Water Development (2004:23) presentation by Mr. SM.N Mainala on the History of existing dams

According to the Ministry of Irrigation and Water Development (2005:1) the intensity and methods of utilisation of these resources can, if not properly managed and regulated, result in their serious deterioration and or depletion. The approach used by the Malawian Government is that in which communities managed, operated and maintained their

boreholes through village level operation and maintenance (VLOM) and community based management (CBM). This forms part of a decentralisation initiative that became prominent in Malawi when the autocratic and one party state was replaced by multi-party democracy which brought the UDF to power in 1994, ending three decades of the rule of the Malawi Congress Party. Methods other than boreholes and hand-pumps were not considered. It has been established that, despite the country being endowed with relatively vast amount of water resources, it is currently encountering a number of growing competing demands and challenges. Some of these include the high population growth resulting in an increase in demand for water for domestic, industrial and municipal uses, agriculture and irrigation, tourism, mining, manufacturing, water transport or navigation, energy or hydropower, and ecological sustenance (Ng'ong'ola, 1999:12, Ferguson and Mulwafu, 2004: 3, DeGabriella, 2002:2).

Figure 6.2 Malawi agricultural water withdrawal



Source: FAO AQUASTAT, 2014

6.2.2.2 Water use

The major water users in the country are the domestic sector, irrigation, hydropower, industry, navigation, recreation and tourism, fisheries, and biodiversity. Water withdrawal for agricultural and domestic purposes has increased over the last decade as a result of socio-economic development and population growth. Agriculture or irrigation is still by far the major water-withdrawing sector, followed by domestic and municipal water supply and industry (Figure 6.2). However, an updated and comprehensive water resource and water use information database is not available in the country (Ng'ong'ola, 1999:3, Ferguson and Mulwafu, 2004: 4, Mkandawire, et. al, 2011:10).

6.2.2.3 International water issues

A great part of Malawi's water resources, namely Lake Malawi, Lake Chilwa, Lake Chiuta, and the Shire, Ruo and Songwe Rivers are shared with the neighbouring countries of Mozambique and the United Republic of Tanzania as trans-boundary and cross-boundary waters. So far, no major conflicts have arisen over the utilisation of these resources, apart from a dispute over Lake Malawi between Tanzania, mediated by the SADC. However, in order to avoid potential conflicts, Malawi is a signatory to a number of international treaties and conventions, including the SADC Protocol on Shared Watercourses, and the 1997 UN convention on non-navigational uses of international waters (Dukuduku, 2002:1, Chipofya, et. al, 2010:263, Mkandawire, et. al, 2011:7).

At a bilateral level, Malawi is implementing a joint project for the stabilisation of the Songwe River course with the United Republic of Tanzania, through the Malawi/the United Republic of Tanzania Joint Permanent Commission of Cooperation (JPCC). The agreement between Malawi and Mozambique was signed in November, 2003. With Lake Malawi and the Shire River system being a sub-basin of the Zambezi watercourse, Malawi actively participates in the Zambezi Watercourse Commission (ZAMCOM), which was signed by the eight riparian member states of the Zambezi River basin in July 2004 in Kasanne, Botswana. Within the SADC region, Malawi is part of other initiatives such as the SIDA initiative and the FAO-supported Convention on the Management of Lake Malawi/Nyasa for Sustainable Development (Ng'ong'ola, 1999:15, Lopez,

Chonguica, Monggae, Sullivan, Tsholofelo, 2008:4). Malawi cooperates with other member states in various river basin institutions to effect pollution control, ensure efficient water resource use, encourage participatory value-based and decentralised management, and commercialised governance in line with the Dublin Principles of IWRM (Ng'ong'ola, 1999: 16).

6.3. Water management, policies, and legislation

6.3.1 Storage dams

Malawi heavily depends on run-of-the-river water for hydropower, irrigation, water supply, and navigation. There are no major storage dams despite the existing potential as well as need. However, there are small reservoirs with storage capacity ranging from a few thousand cubic metres to about 5 million cubic metres which have been constructed for water supply, irrigation, and conservation purposes. These dams total about 749 in number, with total storage of less than 100 million cubic metres or 0.1 km³. Despite the potential and economic viability of multi-purpose water resource developments and management schemes in which dams can be developed for water storage, and raw water can be sold in bulk to be used in irrigation, water supply, fisheries, and electricity generation for example, Malawi has not exploited these opportunities. A multi-purpose approach would make water relatively more available and less costly to the investor. It would also promote investments in water-dependent industries, and contribute to poverty alleviation and the realisation of maximum benefits (Ministry of Irrigation and Water Development, 2005).

A multi-purpose approach could facilitate mitigation of conflicts of interest among various users using the same river as water source, but there are no favourable policy and legal environments for such multipurpose developments. In 1999 the Lilongwe Water Board decided to heighten Kamazu II dam to double the live storage capacity of the reservoir by raising the water level a further 5 metres. This raising of the dam wall might bring about siltation, sedimentation, and green-house gas emission problems. Malawi recently established a water-related infrastructure, the Mulunguzi Dam, and promoted

flood mitigation projects on the Songwe River and Shire River to stabilise the level of Lake Malawi. Other small community dams have been built under the Malawi Social Action Fund (MASAF) and NGOs such as CARE and Rainwater Harvesting Association of Malawi (RHAM) (Ng'ong'ola, 1999:11, Yiziquel, Monclair and Chirwa, 1999:32, Dukuduku, 2002: 3, Ferguson and Mulwafu, 2004:5, Ng'ong'ola, 1999:11, Chipofya, et. al, 2010:263, Mkandawire, et. al, 2011:9 MIWD, 2004:23).

6.3.2 Institutions established to provide water and sanitation

Until 1980s the responsibilities for water supply in Malawi were scattered across units with different sector affiliations. In 1984 the Department of Water was established in the Ministry of Public Works and this ministry implemented water supply and sanitation projects along a centralised supply-driven approach using machine drilled boreholes. In 1994 when the UDF took over, supply-driven and centralised approaches were replaced by a demand-driven decentralised and community-managed approach to water and sanitation supply. The Ministry of Irrigation and Water Development (MIWD) established under the UDF government, withdrew from direct implementation and assumed a role of facilitation, coordination, setting standards, monitoring, and evaluation sector policies. Planning and implementation of water and sanitation projects became the role of local and district assemblies. Since 1996, when the World Bank provided funding for National Water Development Project, it has been a requirement that all implementation responsibilities of the national ministry should be devolved to district and local assemblies. The key focus of the National Water Development Programme was institutional re-organisation and capacity-building for the decentralisation of water supply and waterborne sanitation services. There was a small component of water resource management in the National Water Development Programme (Ng'ong'ola, 1999: 16, Mlwafu, et. al, 2002:3, Welle, 2005:12, Mkandawire, World Bank, 2007:18, 2011: 10).

The other state institutions responsible for water demand management are the Department of Environmental Affairs, the Water Resources Board and five water boards. The Water Resources Board, like the MIWD, is not involved in the reticulation of water, but provides capacity building to service providers, and is responsible for the allocation of

water rights, policy, and institutional changes, the creation of public awareness, wastewater recycling, as well as the development of water pricing policies, the rehabilitation of schemes, catchment protection, and rainwater harvesting. The Department of Environmental Affairs is responsible for issuing licenses, control of water pollution, implementation of the National Environmental Action Plan, and conducting the State of Environment Report. Some of the tasks of the Department of Environmental Affairs overlap with those of the Ministry of Irrigation and Water Development and the Water Resources Board, although the MIWD uses World Water Day to promote water demand management, while the DEA uses World Environment Day to promote water demand management. The Rural Water Supply Department in the MIWD is responsible for the reticulation of water in rural areas, and works with NGOs and with tap, branch, and main committees in various schemes to promote water demand management. Some of the strategies include imposing water restrictions which disallow the use of sprinkler irrigation and watering animals, but this is difficult to enforce and monitor (Mulwafu, et. al, 2002:3, Ferguson and Mulwafu, 2004:6).

The water boards are responsible for the rehabilitation of the old water supply systems, water loss control, water pressure control, the installation of individual meters and billing in institutions, public awareness, appropriate tariff setting, water rationing, and capacity building. Other water demand management duties that water boards perform include categorisation of water uses according to source, advising on the choice of appropriate technologies and suitable crop choices, advising water users and irrigation boards on appropriate agricultural practices, creating awareness about water systems, installing individual household water meters, and removing same if customers do not pay. Mulwafu, et al, (2002:3) cite unsatisfactory financial performance, the use of step tests for water leak detection instead of computer models, and 51% unaccounted-for water, as some of the challenges water boards face in promoting water demand management (World Bank, 2007:21, Mulwafu, et. al, 2002:3).

The implementation of IWRM became a popular approach amongst donor agencies, which included both the World Bank and the African Development Bank. The

justification was that the management of water resources requires an integrated approach involving a number of stakeholders, namely: the Ministries Responsible for Water Affairs, National Water Resources Authorities, water utilities, local governments, Ministries Responsible for Agriculture, Irrigation, Natural Resources, Health, Gender, Youth and Community Services, Education, Lands, Physical Planning, and Human Settlements, other public holders, NGOs, civil society, the private sector, and universities and other training institutions. The roles, responsibilities, and linkages for the above mentioned institutions are described below (World Bank, 2007:21, Welle, 2005:12, Chipofya, et. al, 2010:263, Mkandawire, et. al, 2011:10).

6.3.2.1 Ministry responsible for water affairs

The central function of the Ministry of Water Development is to facilitate the development and management of water resources in the country. Among its responsibilities are ensuring access to safe water and related sanitation services, the provision of safe drinking water to rural communities, the collection of hydrological data, and catchment protection. It has been noted that the link between the Department of Irrigation and the Ministry of Water Development is very weak and needs to be strengthened (World Bank, 2007: 20, Chipofya, et. al, 2010:264).

The role of the ministry in line with IWRM is to provide policy direction and to coordinate water sector programmes. The other much anticipated roles of the ministry are to monitor (in terms of quality and quantity), assess, plan, develop, conserve, allocate, and protect water resources for utilisation in the social and economic sectors of production and services. The ministry is supposed to manage and disseminate water resources and sanitation information but this role is its weakest point. The ministry is expected to invest in sectoral planning development and the construction of water infrastructures including multi-purpose dams, but the major part of the investment comes from donors and NGOs. The ministry is expected to promote and adhere to regional and international obligations and agreements without compromising the country's sovereignty, security, and territorial integrity; however the conflict between Tanzania

over the ownership of Lake Malawi is putting this role to the test (Ministry of Irrigation and Water Development, 2005).

The ministry is expected to work with other agencies to develop systems for early warnings on floods, droughts, and pollution, but this role is not performed to everybody's satisfaction. The other poorly performed function is to undertake policy formulation reviews and enforcement; the policy review is going well, but law enforcement is weak as is its execution of the role to establish standards, guidelines, and an inspectorate. The ministry is expected to develop and regulate water utilities in terms of tariffs and financing, and to undertake training and capacity-building in the water and sanitation sector. The regulation of water boards is also weak (National Water Policy 2005, Chipofya, et. al, 2010:263, Mkandawire, et. al, 2011:9).

6.3.2.2 National water resources authority

“The Water Resources Act of 1969 gives legal authority for the management of water resources to the Minister Responsible for Water Resources. The Act further delegates certain functions to the Water Resources Board as an advisory body to the Minister. Board membership was reconstituted in 1995 to strengthen it and assume the extra role of water resources management. The reconstituted board comprises five ex-officials and not more than six independent members. The ex-officials are two representatives of the Ministry Responsible for Water, one representative each from the Water Resources Department, Office of the President and Cabinet, and the Ministry of Commerce and Industry” (Ministry of Irrigation and Water Development, 2005). Allocations of the responsibilities are not clear in the 2005 version of the Water Policy. “The Minister appoints independent members. The Water Resources Board does not have a management unit that can run its day to day operations; it is an ad hoc committee whose secretarial services and following-up on issues is performed by the Water Resources Department. It therefore cannot perform its responsibilities on water resource management. In the new water dispensation the Water Resources Board is an institution operating within the Ministry of Water Development and is responsible for the granting of water rights for abstractions and the discharge of effluents, as well as for monitoring the adherence to

water rights, rights for the development of irrigation schemes, and water rights for abstraction and discharge of wastewater drained from irrigation schemes, have to be granted by the board” (Ng’ong’ola, 1999:19, Chipofya, et. al, 2010:263).

“The authority’s roles are to co-ordinate and harmonise the activities of the catchment management authorities and all other stakeholders; and to advise on prescribing and determining the establishment of water user associations, especially for rural supply schemes and any other schemes (for domestic, irrigation, or fisheries) owned and operated, maintained and managed, by rural communities or required by entrepreneurs” (Ministry of Irrigation and Water Development, 2005). It is difficult to assess the WRB on the above roles since CMAs are still in the process of being established, but detailed comments on the Mpira Water Authority are provided in the next section. The WRB is also expected to determine and collect fees related to water abstractions and discharges, approve any developments and or improvements related to water resources, ensure that water resources buffer zones are properly managed, declare water catchments as water controlled areas, control and apportion water use in the country, and issue water abstraction and discharge licenses. There are many instances where boreholes are constructed by institutions without licenses and the WRB is unable to provide information about water resources in the country (National Water Policy 2005, Chipofya, et. al, 2010:263, Focus Group Discussions, 2010).

6.3.2.3 Water utilities and boards

The Water Works Act of 1995 established five water boards for Blantyre, Lilongwe, the South, the North, and the Centre of Malawi. Each board has a management establishment to run its day to day activities and operations. The board has directors which represent stakeholder interests. Its membership comprises the Secretary for Education and the Secretary for Health, and the Minister is entitled to appoint three independent members and six members who represent water rate payers in the water area served by the board (Ng’ong’ola, 1999:19, Bolokonya, 2010).

The key output of the decentralisation of water utilities was meant to be fast-tracking of their commercialisation, as well as private sector participation to improve efficiency. The World Bank and PPIAF funded the privatisation of the Blantyre and Lilongwe Water Boards, to the tune of US\$194,000, in addition to US\$36,200 in consultancy fees paid to US consultants, Stone and Webster. In 2007 another US\$149,550 was set aside to develop a communication strategy, facilitate stakeholder participation, and increase political will to privatise and commercialise water reticulation and resource management (Friends of the Earth International and World Development Movement Report, 2010). Ng'ong'ola (1999:11) outlines the reason for the decentralisation of water utilities under the management of commercial regional water boards established under the Waterworks Act of 1995, as improvement of operational efficiency. The Blantyre Water Board and the Lilongwe Water Board do not receive any financial support from the government; only policy direction. They abstract water from the Shire and Lilongwe rivers respectively and provide purification in various treatment plants. The new role of commercialised and commodified water utilities is described below (Ng'ong'ola, 1999:11, World Bank, 2007:21):

“Water utilities are expected to operate and manage waterworks for delivery, distribution, and management of potable water supply. They are also supposed to develop and implement minor water-work infrastructures; collect, transport, treat and dispose of or recycle and re-use waste water; and promote sanitation services. As a water regulator, they are expected to enforce waterworks by-laws related to the construction of delivery and connection facilities of services for water supply and water-borne sanitation in declared water areas. They are further expected to implement investment programmes, and tariffs and compensations related to the development and management of water supply and water-borne facilities and services” (Ministry of Irrigation and Water Development, 2005).

Most of the above functions are normally performed by national ministries that regulate bylaws on a national level and local authorities that regulate and enforce bylaws at the local level. It is not a mistake that water boards are often associated with acts of pollution

discharges in the areas where they operate. The institutional framework that promotes self-regulation makes them the worst polluters in Malawi. “Water boards are also expected to monitor water quality in the water supply systems and promote catchment management and pollution control; collect, process, analyse and disseminate relevant data and information to all stakeholders within the water sector; and promote private sector participation in the delivery of water supply and sanitation services (Ministry of Irrigation and Water Development, 2005.” It is unrealistic to expect a polluter to control pollution and to distribute useful information to stakeholders. In the next section it is clear that the SRWB was not keen to distribute information about water rationing and pollution to stakeholders; driving privatisation became their strong point instead” (National Water Policy 2005, Chipofya, et. al, 2010:264, Focus Group Discussions, 2011).

6.3.2.4 Local governments

Local government institutions are still in the process of being established. Councillors were expected to be elected in 2014 and for the first time local authorities will be managed by mayors. “The roles of local governments shall be to plan and co-ordinate the implementation of water and sanitation programmes at local assembly level; solicit funding for the implementation of water, sanitation and environment programmes; collect, process, analyse and disseminate relevant data and information to all stakeholders within the water sector; and promote private sector and NGO participation in the delivery of water supply and sanitation services” (Ministry of Irrigation and Water Development, 2005). All of the above functions will be monitored from 2014 onwards when accountable and responsible local government institutions are expected to be established (Chipofya, et. al, 2010:264, Mkandawire, et. al, 2011:10).

6.3.2.5 Ministry responsible for agriculture services

Agriculture is the major sector responsible for high water withdrawals. The sector leader is the ministry responsible for agriculture whose roles are: “to promote and ensure that good land husbandry practices are followed in all use and cultivation endeavours, and to prevent water resource degradation and pollution from soil erosion and agrochemicals” (Ministry of Irrigation and Water Development, 2005). These functions require strong law

enforcement and regulation among commercial farmers. “The ministry is expected to promote collaboration with the NWRA so that good watershed management and catchment protection practices can be followed in controlled areas and along river banks; agriculture practices that improve food security and poverty reduction be promoted and on-the farm water harvesting and conservation be encouraged” (Ministry of Irrigation and Water Development). Rain water harvesting is generally very weak in Malawi and even catchment protection is not particularly strong. “The Ministry is expected to collect, process, analyse, and disseminate relevant data and information to all stakeholders in the water sector, and provide water demand requirements for agricultural development to the Ministry of Water Affairs (Chipofya, et al, 2010:265, Mkandawire, et al, 2011:11).

6.3.2.6 Ministry responsible for irrigation services

There is also irrigation service function in the MIWD and there is confusion about the fact that this unit is not in the Ministry of Agriculture. “The roles of the Ministry are to promote collaboration with the NWRA so that good watershed management and catchment protection practices can be followed in controlled areas and along river banks. The Ministry further promotes irrigation practices that improve food security and poverty reduction, and encourages and promotes on-the-farm water harvesting and conservation. Other responsibilities include the promotion and regulation of irrigation development and practices to ensure poverty reduction, efficient utilisation of water, and the prevention of pollution and water-related diseases in irrigation fields” (Ministry of Irrigation and Water Development, 2005). All of the above functions are similar to those of the Ministry of Agriculture and it is difficult to hold anyone accountable if such functions are not performed.

“The Ministry is also responsible for promoting water resources development for irrigation in order to increase food security and enhance economic welfare while taking due consideration of mitigating environmental damages. The Ministry is further expected to collect, process, analyse, and disseminate relevant data and information to all stakeholders in the water sector. Finally, the Ministry is tasked with providing water demand management requirements for irrigation developments to the Ministry of Water

Affairs” (National Water Policy, 2005, Chipofya, et. al, 2010:265, Mkandawire, et. al, 2011:11).

6.3.2.7 Ministries responsible for mines, forestry, fisheries, lands, environment, and parks and wildlife

“The Department of National Parks and Wildlife and the Department of Forestry are responsible for the protection of catchment areas that fall within their jurisdiction” (National Water Policy, 2005). Some of the rivers which are diverted for irrigation purposes arise from areas designated as national parks, game reserves, or forest reserves and there is consequently a need for collaboration between these departments and the Department of Irrigation. The changes in environmental laws which started in 1994 with the National Environmental Action Plan, followed by the National Environmental Policy and the National Environmental Act of 1996, helped to shape the water-related sectors of Forestry, Fisheries, Parks and Wildlife, Agriculture, and Irrigation (Ferguson and Mulwafu, 2004: 6, Chipofya, et. al, 2010: 264).

“The roles of these institutions is to facilitate the delineation of regulating areas, planning, zoning, and development in controlled water areas; control land allocation; ensure fragile and marginal areas are not used for agriculture activities; and ensure that there are no permanent settlements in areas planned for reservoir and dam developments. They are also expected to improve the conservation and protection of catchment areas of all public water bodies, promote the protection and rehabilitation of river catchments to restore a favourable ecosystem environment, contribute to the eradication of noxious aquatic weeds and control their spread, and co-ordinate all cross-cutting environmental activities required for water resources management and water services. They are further expected to facilitate the identification of water resource problems to be included in the state of the environment report, enforce legislation and implement policies on natural resources management, and provide water demand requirements on natural resource developments to the Ministry of Water Affairs” (Ministry of Irrigation and Water Development, 2005). There is no evidence that any of the above functions are being

performed and therefore they continue to be a mere vision in the eyes of the Malawi government (Chipofya, et. al, 2010:264).

6.3.2.8 Ministry responsible for health and meteorological services

The Ministry of Health is active in Ntcheu and Balaka in the prevention of waterborne diseases. “Its role is to ensure proper management and disposal of clinical and hospital wastes to avoid environmental pollution. The strongest points of the ministry is the role it plays in promoting health and hygiene education in water and sanitation services, monitoring and providing guidance concerning the quality of drinking water, providing appropriate interventions to prevent the prevalence of water-related diseases, and providing research in water-related health issues” (Ministry of Irrigation and Water Development, 2005). In the next section of this chapter most of the functions of the ministry are clarified. Other lesser known functions are to provide guidance on HIV/Aids mainstreaming efforts to the water and sanitation sector, and to provide water demand requirements for public health institutions (Chipofya, et. al, 2010:265). The role of the Ministry of Meteorological Services is “o provide relevant meteorological data which include rainfall, temperature, relative humidity, wind speed, evaporation, length of sunshine hours, cloud cover, and radiation for development and management of water resources, and to provide information relating to weather and climate forecasts.” The data presented at the beginning of this chapter is drawn from this ministry (Chipofya, et. al, 2010:265).

6.3.2.9 Non-governmental organisations and civil society

Non-governmental organisations play a very important role as sources of funding, policy advocates, and critics of government as indicated in this and forthcoming chapters. “The roles of these organisations include assisting in the empowerment of communities to have community-based water services and water resource management in planning, implementation, operation, and maintenance. They are tasked with encouraging communities to manage their rural water supply systems, community dams, and catchment protection. They are expected to participate in the provision and investment of rural water supplies and community dam development consistent with prevailing

government policies and guidelines on such investments. They are expected to assist in the mobilisation and securing of funding for rural and low income communities for water and sanitation projects, and to assist in community sensitisation on water, sanitation, catchment management, and conservation” (Ministry of Irrigation and Water Development, 2005).

The work of NGOs such as World Vision, Water Aid and Concerned Universal, reflect most of the abovementioned functions as indicated in next section of this chapter (Chipofya, et. al, 2010:266, Water Policy, 2005, Mkandawire, et. al, 2011:11). NGOs are also known to liaise between rural low-income communities, government, donors, and other cooperating partners through local governments. They assist in the provision of water supply and sanitation services in rural areas and low income groups within urban centres; they collect, process, analyse and disseminate relevant data and information to all stakeholders in the water sector in accordance with national statistic guidelines and standards. WES NGOs (an umbrella body of NGOs working in the water sector in Malawi) always consult the Ministry of Water Affairs on issues related to water and sanitation developments, and ensure compliance with national policies and regulations governing water and sanitation activities, including registration with the Ministry of Water and Sanitation and other relevant authorities (Chipofya, et. al, 2010:266, Water Policy, 2005, Mkandawire, et. al, 2011:11).

6.3.2.10 Private sector

The interest of the private sector in water resource management in Malawi is very low. Commercial farmers and big companies such as Illovo are most active in water resource development through the construction of waste water treatment plants and irrigation dams. The roles of the private sector involve investing in water resource development and water supply and sanitation services and assisting community based water management activities by providing, on a commercial basis, the necessary inputs to CBM like the sale of spare parts and skilled maintenance services for water supply systems. Finding spare parts for boreholes and other schemes is difficult in Malawi, as indicated in the next section of this chapter (Chipofya, et. al, 2010:266, Lopez, et. al, 2008:6).

Other anticipated functions of the private sector include providing capacity for consulting and contracting services in water, sanitation, and related industries; conducting research, and developing and promoting local manufacturing capacity for water and sanitation-related services; and collecting, processing, analysing and disseminating relevant data and information to all stakeholders in the water sector, in accordance with national statistics guidelines and standards. The most difficult function is to ensure compliance with national policies and regulations governing water and sanitation activities, including registration with the Ministry of Water Affairs and other relevant authorities. Polluters all over the world get away with pollution of water resources, and it is unrealistic to expect them to comply in Malawi where the regulatory framework is weak. Major water users are also expected to consult with the Ministry of Water Affairs on issues related to water and sanitation development, as well as to provide capital for investment in water and sanitation developments (Chipofya, et. al, 2010:266, Lopez, et. al, 2008:6).

6.3.2.11 Other public stakeholders

There are other state institutions that perform certain functions in water resource development although they do not play a role in IWRM platforms. “The Ministries responsible for Commerce, Industry, Science and Technology, regulate the development and operation of industry and trade that may contribute to over-exploitation and pollution of public waters, through conditional licensing. The Ministry of Transport shall be expected to control and regulate navigation, roads, railways, and airport development plans, and to protect water from pollution. It shall also co-ordinate navigational development and plans with the Ministry of Water Affairs to ensure that the operations are accommodated in water resource development and management plans. The Ministries responsible for Land, Physical Planning, and Human Settlements shall coordinate and provide policies and the regulatory environment to promote sustainable human settlements and developments in both urban and rural areas in relation to water and sanitation. The Ministries responsible for Gender, Youth and Community Services, shall liaise with the Ministry of Water Affairs in community mobilisation for community-based

management training, advocacy, awareness, and gender mainstreaming (National Water policy, 2005, Chipofya, et. al, 2010:265).

“The Ministry of Education shall liaise with the Ministry of Water Affairs in curriculum development and capacity building programmes that will support efforts in water resource management, development, and utilisation, and should also provide water demand requirements for its institutions. The Malawi Bureau of Standards shall liaise with the Ministry of Water Affairs in setting standards of treated and untreated water supply services and effluents that can be discharged into the environment. Local universities and other local training institutions shall promote research and undertake capacity building in water and sanitation. The primary function of the Department of Environmental Affairs is to ensure that the implementation of projects does not result in degradation of the environment. For all irrigation schemes of more than 10-ha, environmental impact assessments are conducted. The Malawi Energy Regulatory Authority (MERA) shall liaise with the Ministry of Water Affairs on issues relating to the development of hydropower” (National Water policy, 2005, Chipofya, et. al, 2010:265).

6.3.2.12 Mpira Water Authority

The Catchment Management Agency was established by water users in Balaka, Ntcheu, Mangochi, and the Neno Districts, members of the catchment management committees around the Mpira Dam, the Ministry for Irrigation and Water Development and the Ministry of Local Government and Rural Development. It is managed by a Chief Executive Officer who is an ex officio member of the board of trustees. The members of this board are nominated by the Ministry of Irrigation and Water Development, the Ministry of Local Government and Rural Development, the traditional authorities of Mpando, Kwataine, Makwangwala, Champiti, Nsamala, Symon-Likongwe, and Kalembo, and the district commissioners from Ntcheu, Balaka, Mangochi, and Neno. The district commissioners are ex-officio members of the board by virtue of being district commissioners of the above districts (Constitution of Mpira Water Authority, 2007).

The Mpira Water Authority was expected to take over from the government of the Republic of Malawi the ownership, control, management, and operations of the Mpira/Balaka Rural Water Supply Scheme (Champiti, 2008). It was also expected to provide safe drinking water to the communities set out in a schedule to some parts of the Balaka, Ntcheu, Mangochi, and Neno districts. It was also expected to ensure proper operation and maintenance of the water equipment and machinery. The authority was established to ensure good health to communities by providing safe and potable drinking water and to promote proper sanitation and hygiene practices. It was also expected to resolve and mediate disputes which may arise amongst members of the said communities with regards to the accessibility to safe and potable drinking water, or incidental thereto. Noting lack of capacity in local and district assemblies, it was expected to provide capacity building for the improvement of knowledge, talents, skills, and management to run the operations and ensure the sustainability of the authority. In line with the cost recovery principles of the MIWD, the authority was expected to ensure that members pay all dues in order to cover the full cost of operating and maintaining the water supply (Constitution of Mpira Water Authority, 2007).

The authority was also expected to solicit other sources of funding for specialised activities. Working with other state agencies, it was expected to promote the advancement and recognition of gender equality through the inclusion of responsive approaches in rural socio-political and economic set-ups and affirmative action. Pollution abatement was also the responsibility of the authority and it was expected that its operations would be conducted and managed in accordance with sound environmental practices (Constitution of Mpira Water Authority, 2007:3, Champiti, 2008). The catchment management agency was established along the IWRM principles of managing water at the lowest level possible and along commercialised and government owned ring-fenced institutional arrangements. CMAs are under the direction of the National Water Resources Board although it performs decentralised functions at a local level, and the participation of water user associations (WUA) is encouraged (Ferguson and Mulwafu, 2004: 13).

6.4. Water resource management

In 1994 the government of Malawi, through the then Ministry of Works Supplies and Water Development, adopted a Water Resources Management Policy and Strategies document. This document served as a guide in all matters relating to water resource management, and facilitated the decentralisation and improvement of water supply operations in the country. In terms of the Water Resources Management Policy and Strategies, “water should be managed and used efficiently and effectively to promote its conservation and future availability in sufficient quantities and acceptable quality. All programmes related to water should be implemented in a manner that mitigates environmental degradation and at the same time promotes the enjoyment of the asset by all.” Through this water resource management dispensation, allocation of water is designed in a way which recognises water not only as a social but also as an economic good, and in a manner that achieves maximum benefit for the country. The policy also advocates safe disposal of waste water in water supply services. It further advocates investment of public funds in water programmes guided by net economic, social, and environmental benefits; and stakeholder participation (users, public and private sectors). The pricing of water should reflect the demand for and costs associated with water services, and the pricing policy should be aimed at a reduction of government financial support to the sector over time. The emphasis of the policy was on decentralisation and commercialisation of water boards and the establishment of regional water boards (Southern, Central and Northern) to replace the defunct District Water Supply Fund of the Ministry of Irrigation and Water Development (Ng’ong’ola, 1999:17, Chaima, 2010, Bolokonya, 2010).

In 2001, the Irrigation Act was passed. Both the Irrigation Act of 2001 and the Water Resources Act of 1969 provide for the formation of water user associations or irrigation management authorities to promote local community or farmer participation in the development and management of irrigation and drainage, and the proper utilisation of available water resources. In 1999 only 70,000 hectares of land was developed for irrigation due to a lack of reliable and equitable access to irrigation infrastructures. Lake

Malawi has a navigation capacity of 100,000 tonnes of cargo and carries 200, 000 passengers per year, yet only 200 megawatts of hydropower plants were developed and fish catches have dwindled due to drought, soil erosion, and sediment transportation which negatively affect aquatic life and fish species. In 1998 the Ministry of Agriculture produced a Manual of Hydrological Design Guidelines for Small Earth Dams. The manual assists the government to determine the design for flood attenuation and to provide adequate capacity of spillways to pass the flood. The guidelines help the government to monitor siltation and degradation of catchment areas due to the pressure of agricultural production, rapid population growth, poverty, and wood energy demands. It further guides the government on protecting dams against sedimentation and deforestation (Ng'ong'ola, 1999:13, MIWD, 2004:24, Mkandawire, et. al, 2011:7, Chipofya, et. al, 2010:262).

Water resource management is in its infancy in Malawi. Designed water storage capacity is 9m³ per person, one of the lowest figures in the world and a quarter of that of Ethiopia. Irrigation is minimal. Catchments are inadequately protected from deforestation and pollution. Over 90% of Malawians use firewood or charcoal for cooking, leading to what is said to be the highest rate of deforestation in Africa. This rapid deforestation, compounded by poor agricultural practices and environmental degradation in most river basins, has led to rivers and streams silting up, being flashy, drying, up or receding faster in dry seasons. Soil erosion and sediment transportation results in habitat alteration and have an adverse effect on aquatic species, leads to the filling of water courses and reservoirs, to an increase in the cost and difficulty of water treatment, and to a reduction in the recreational quality of water bodies. The non-enforcement of by-laws has resulted in huge erosion along river banks that were previously thickly wooded; the country's water resource problems are consequently multiplying (MIWD, 2004:24, Ng'ong'ola, 1999: 10, WaterAid, 2005:4, Mkandawire, et. al, 2011:8, Chipofya, et. al, 2010:262).

6.5 Finances and sustainability

The implementation of IWRM requires fund allocation to decentralised institutions and the creation of an enabling environment for such local institutions to discharge their

responsibilities as envisaged in Water Works Act of 1995. The government policy on financing irrigation developments in the country stipulates that such developments only be minimally subsidised. The government aims to optimise its investment in irrigation development through the application of the principles of cost sharing, user pay, market based, demand-driven cost recovery (Mulwafu, et. al, 2002: 5, Ferguson and Mulwafu, 2004: 7, Mkandawire, et. al, 2011:12).

The government's Public Sector Investment Programme, through which it is expected to allocate funds for water supply, sanitation, and other water-related activities, demonstrates the low levels of government investment in various aspects of water resource management. In the construction of infrastructures such as dams, there are no options for bulk water purchases by water boards; each institution must invest in the building of its own structures and the supply of reticulated water to its customers. The absence of state subsidies results in water infrastructures becoming dilapidated and overhead costs increasing and eventually having to be paid for by customers. For the 2004/05 financial year, the Malawi government's budget for water supply and sanitation was approximately US\$23 million, representing 3% of total government expenditure. This figure has been constant over the last two years. Of this money, only 12% comes from the government's own revenues, while the remainder constitutes loan or grant finance from external support agencies. Some 97.5% of the water and sanitation budget is allocated to water, and 2.5% to sanitation. The urban/rural subdivision is not recorded. There is no budget allocation for water boards and consequently a need to rely on private investment in order to construct, operate, and maintain infrastructures (Ng'ong'ola, 1999, 14, Water Aid, 2005).

Approximately 10% of the money allocated to the water sector was classified by the government as 'pro-poor expenditure' (PPE). PPE is not additional money coming into the sector, but a system of re-defining parts of the existing budget. The government's PPE expenditure is widely publicised, for example, through newspaper announcements. But in the PPE budget, the proportion allocated to water fell by 37% over the last two years (Ferguson and Mulwafu, 2004: 12, Water Aid, 2005). Financial information from non-

government sources is not collected, but can be estimated from water point mapping because the water points installed by various types of agencies are counted. These figures indicate that three quarters of all water points in the country have been installed by unknown or unmonitored organisations. Allowing for their lower unit costs and their predominantly rural focus, this suggests that funding from non-government sources might be in the range of \$30-50 million per year (WaterAid, 2005:8, Mkandawire, et. al, 2011:13).

With low levels of state funding allocated to water, the emphasis is on demand management strategies, the commercialisation of water for domestic and other uses, cost recovery, maintenance, and operation, paid for by users in urban areas. In urban areas, water boards are run as businesses, create an enabling environment for private sector participation, become price determinist, and apply full-cost accounting. In rural areas communities assume the costs of installation, operation, maintenance, and repair of boreholes and gravity-fed piped water systems while the government abdicates most of these responsibilities in order to stay in line with the IWRM principle of managing water at the lowest level possible and recognising water as an economic good (Ferguson and Mulwafu, 2004: 12).

6.6 Policies and legislation

Water is a finite resource. Its conservation, allocation, and utilisation must therefore be guided by a strong policy framework and strategies to achieve policy objectives (Ng'ong'ola: 1999:8). To this end the government of Malawi developed the first coherent Water Resources Management Policy and Strategies in May 1994 to guide the country in the sustainable use of water and sanitation. However the Policy largely focused on water service delivery whose major outcome was among other things, the creation of a Ministry of Water, three regional water boards, namely the Northern, Central, and Southern Region Water Boards, and a reconstitution of the Water Resources Board, namely the Blantyre and Lilongwe Water Boards. The 1994 Water Resources Management Policy and Strategies was subsequently revised and approved by government in 2000 to strengthen the management aspect of water resources which was considered to be weak in the 1994

policy (Mulwafu, et. al, 2002:3, Ferguson and Mulwafu, 2004: 6, Chipofya, et. al, 2010:262, MIWD, 2005:1, Bolokonya, 2010, Mkandawire, et. al, 2011:10).

Policy issues are addressed by the National Irrigation Policy and Development Strategy (2000) developed by the Department of Irrigation, the Water Policy (1996), the Water Resources Management Policy and Strategy (2000) developed by the Ministry of Water Development, the National Environmental Action Plan (1994), the Environmental Management Policy, and the Environmental Management Act (1996). The main legislation regarding water resources and irrigation are the Water Resources Act of 1969 and the Irrigation Act of 2001 (Ferguson and Mulwafu, 2004:8, Chipofya, et. al, 2010:262).

According to the Irrigation Policy and Development Strategy, “the mission of the Department of Irrigation is to manage and develop water and land resources for diversified, economically sound, and sustainable irrigation and drainage systems under organised smallholder and estate management institutions, and to maintain an effective advisory service.” Following this policy, an Irrigation Act (No. 16 of 2001) was passed by parliament in November 2001. The Act makes provision for “the sustainable development and management of irrigation, protection of the environment from irrigation-related degradation, the establishment of a national irrigation board, and for matters connected therewith or incidental thereto.” The promulgation of the Environmental Management Act of 1996 brought about the “devolution of natural resources management from the central state to primary users which include individuals, communities, and user associations.” This brought about a shift from open access to private property dispensation, income generation, co-management of fisheries and wildlife by government and communities, and a community-based natural resource management model. The central state is reluctant to transfer rights to communities because of uncertainties about their capacity to manage water, as well as the new sources of power that would be given up by the ruling elite to local levels, a kind of political suicide. This was one of the delays affecting the establishment of the Mpira Balaka Catchment Management Agency which

only became fully functional in 2012 (Ferguson and Mulwafu, 2004:9, Chipofya, et. al, 2011:262).

6.6.1 National Water Policy of 2005

The overall policy goal of the Water Resources Management Policy and Strategy “is sustainable management and utilisation of water resources in order to provide water of acceptable quality in sufficient quantities, and to ensure the availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian at all times” (MIWD, 2007:24). The policy was revised to include a number of issues which were not clearly addressed in the previous policy documents. The National Water Policy of 2005 was meant “to address all aspects of water, including resource management, development, and service delivery. The policy articulated a new water sector vision of “water and sanitation for all, always” and comprehensively covers areas of water resource management and development, water quality and pollution control, water utilisation, disaster management, and institutional roles and linkages. The policy also advocates an integrated approach to the management of water resources in the country thereby recognising the importance of other policies and acts for achieving goals” (Chipofya, et al, 2010:263).

The vision encapsulated in the policy focuses on “achieving sustainable development and IWRM that makes water readily available and equitably accessible by all Malawians in pursuit of socio-economic development as well as for environmental sustenance.” The policy is “aimed at ensuring water of acceptable quality for all needs in Malawi, and achieving sustainable provision of water supply and sanitation services that are equitable, accessible, and used by individuals and entrepreneurs for socio-economic development at affordable costs. The policy is also geared towards promoting efficient and effective utilisation, conservation, and protection of water resources for sustainable agriculture and irrigation, fisheries, navigation, eco-tourism, forestry, hydropower, disaster management, and environmental protection.” In line with these policy provisions, “the MIWD was expected to undertake the rehabilitation, upgrading, extension and construction of water infrastructures, and promote international cooperation in the management of trans-

boundary and cross-boundary waters without compromising the country's sovereignty, security, and territorial integrity.”

The MIWD was expected “to deal with the challenges facing water resource management which includes the need to adopt IWRM principles, the need to conform to current regional and international agreements and protocols on shared water resources, catchment protection and management, and water resources monitoring”. The MIWD “is expected to promote participation from the private sector in water resource development, management, and service delivery, and to strengthen and build capacity in the water sector”. The policy provides clarification on the roles of the Ministry for Water Affairs and other stakeholders in the water sector (Ferguson and Mulwafu, 2004: 12, MIWD, 2005:3).

6.6.2 Water Resources Act, 1969

The Water Resources Act of 1969 deals with the control, conservation, apportionment, and use of water resources in Malawi. In terms of Section 16 of the Act it is an offense for any person to interfere with, alter the flow of, pollute or foul any public water. The Act requires that water projects avoid water degradation and depletion when developing new water supply schemes and rehabilitating or upgrading existing ones. Projects must also ensure that waste water from water supply points is properly treated so that it does not pollute the environment. The Act is silent on schedules of offences and penalties, water rights, water harvesting, water savings, transfer of water resources, and stakeholder participation (Ferguson and Mulwafu, 2004: 11, MIWD, 2007: 24, Chipofya, et. al, 2010:262).

Under the Water Resources Act of 1969 “all water abstractions must be licensed, except for general household domestic use, and so must as all industrial effluent discharges into public water bodies, including human sewage.” Annual permits are required for abstractions greater than 1,000 L/day, except for domestic use. The charge system is based on the water source and type of usage but revenue collections are severely limited by lack of staff. Together with the efforts to revise the above policy there are attempts to

revise and amend the Water Resources Act of 1969. This revision process has been very slow. In fact efforts to revise the Act started in the mid-1980s but were never finalised. Following recent revisions of the policy, efforts were underway to amend the Act in 2012, but the change of government from the DPP to the PP in 2012 and the subsequent defeat of the PP in 2014 general elections caused further delays. The existing Act “makes provision for the control, apportionment, and use of the country’s water resources”. The Bill was presented in Parliament, but was never passed in 2014 (Ferguson and Mulwafu, 2004: 11, Champiti, 2008, Chipofya, et. al, 2010:262, Ng’ong’ola, 1999:17, Chunga Interview, 2014).

The Water Resources Act makes provision for “the ownership of water resources which rests with the state president, and the inherent right to the use of water for domestic purposes by every person, without a permit.” However there are water users who extract water for commercial purposes and divert rivers without licenses. The Act further elaborates on “recording the water rights that existed before the Act of 1969”. It makes provision for “granting water rights for the use, development, conservation, and diversion of water resources from rivers, streams, lakes, or underground, or consents to discharge waste into public waters to an applicant.” However, commercial users are often accused of diverting water resources for profit maximisation purposes (Chunga, Interview, 2014). The Act stipulates the “revision, variation, and determination of water rights and control of pollution of public water. It also caters for miscellaneous powers to declare controlled areas suitable for purposes of natural resources management, or the creation of an easement. It contains schedules for the establishment, composition, and modus operandi of the Water Resources Board that assists the Ministry of Water Resources in the implementation of the Act and the administration of water resources” (Ferguson and Mulwafu, 2004:11, Ng’ong’ola (1999:17).

6.6.3 Water Works Act of 1995

The commercialisation of the SRWB is located in the legislation that created it. The Water Works Act of 1995 repealed all previous water works Acts in Malawi, including the Blantyre Water Works Act of 1971 and the Lilongwe Water Works Act of 1987

which gave legal status to the Blantyre and Lilongwe Water Boards respectively. All water boards are now established and operate under the Water Works Act (1995). This Act essentially provides the legal framework for implementing the 1994 Water Resources Policy in the provision of water supply and waterborne sanitation services to urban and semi-urban centres of Malawi. The IWRM amendments provided deeper advice on the role of the SRWB in recognising water as an economic good; the draft amendments proposed in the Water Works Act of 1995 seek to extend the mandate of water boards to reticulate water and provide sanitation services in rural areas; to include provisions for stakeholder participation in the ownership, management, and maintenance of water schemes; to recognise water as an economic good; and to promote private sector participation, cost recovery, demand management, and decentralisation (Ng'ong'ola, 1999:18, Ferguson and Mulwafu, 2004:11, Chipofya, et. al, 2010:264). It has the following 6 main parts:

The first part of the Act deals with the establishment, membership, powers, and duties of water boards to deliver water supply and waterborne sanitation services, and to own and control water works in designated urban water areas. The Mpira Water Authority is expected to deliver dry sanitation in rural areas. As part of IWRM implementation, urban water supply and sanitation is the precinct of water boards whereas rural water supply and sanitation is the responsibility of the Mpira Water Authority. The board's contribution and its functional procedures are further elaborated in this section. The second part deals with operational powers to enter land and trespass, compensate, install and suspend services, construct fountains in and outside a declared water-area for the purpose of providing water supply and waterborne sanitation services or works associated and related thereto. The SRWB uses this procedure to disconnect households that are unable to pay for services. The third part deals with the services and supply of water upon request and thorough construction and connection of services whose cost shall be borne by the owner of the premises where such works have been performed. Where such works are for the re-adjustment of existing facilities, the costs shall be borne by the board. This demand-responsive approach is responsible for the lack of facilities in most parts of the country where households who are unable to pay connection fees are simply not provided

with services (Ng'ong'ola, 1999:18, Champiti, 2008, Chipofya, et. al, 2010:264, MIWD, 2007).

The fourth part deals with the operation of waterborne sewerage and sanitation services by the board, where it shall provide public sewers and sewerage disposal works, and keep the maps of public sewers. At the same time, it has the power to alter or close a public sewer and to restrict certain matters from being discharged, while observing the rights of residents within and outside the water area to have access to a public sewer for drainage. The interests of the public are often not catered for. The fifth part caters for financial provisions, stipulating that the boards shall fix the rates and make changes for the supply of water, charge costs to the premises where such costs have accrued, set revenue schedules, and have powers and regulations for the disposal of funds, investments, government advances, borrowing, making rules for accounting, auditing, and financial management of its funds with the approval of the minister. This is often done without consulting communities because it is not provided for in the regulations governing water boards. The final part deals with miscellaneous sections which oblige the board to respond to inquiries from the Minister Responsible for Water Supply and Sanitation regarding any failures to perform its duties. There are very few instances where the MIWD has intervened because water boards have failed to perform their functions. The Act also sets out offences and penalties, the power to make by-laws, powers to recover penalties and moneys, limited time allowed for prosecution, and the repeal of previous Water Works Acts, with a schedule which establishes or re-establishes Blantyre, Lilongwe, and the Northern, Central and Southern Region Water Boards. This clause in the Act makes them independent and uncontrollable by the Minister of Water Supply and Sanitation. IWRM implementation is premised on the independence of water boards (Ng'ong'ola, 1999:18, Champiti, 2008, Chipofya, et. al, 2010:264, MIWD, 2007).

6.6.4 The National Sanitation Policy of 2007

The Malawi Joint Water and Sanitation Sector Review that took place in 2001 highlighted the low levels of sanitation coverage, estimated at 10%, and the fact that the areas which are served with good water supply do not experience a reduction in

diarrhoeal diseases because the water supply is not always accompanied by sanitation and hygiene promotion. The need to develop a sanitation and hygiene policy with clear strategies for implementation and well-defined schedules and targets, was clear. The Mpira Balaka Water scheme funded through the African Development Bank did not include a sanitation component because the profile of sanitation was low in Malawi and the country did not have a sanitation policy and guidelines. Poor hygiene in schools and health centres and at the household level resulted in an outbreak of waterborne diseases (DeGabriele, 2002: 4).

In addressing the need to strengthen health and hygiene promotion, the Government of Malawi (2007:3) is in the process of promulgating a national sanitation policy. The aim of the policy is “to provide a framework for the development of programmes and initiatives to address hygiene and sanitation problems. These programmes will contribute to improving the health and quality of life, a better environment, and a new way for sustainable wealth creation.” The National Sanitation Policy “makes provision for an institutional framework and role clarification among sector stakeholders”. “It will be effected after enacting and creating a legislative framework, leveraging financial support for a sector-wide approach, establishing a Sanitation Directorate in the Ministry of Irrigation and Water Development to coordinate other sector partners and provide human resource to implement the National Sanitation strategy, and ensuring that infrastructure backlogs are addressed as per the provisions of the policy” (GOM, 2007:6, Champiti, 2008).

The vision of the sanitation policy is “Sanitation for all, always, in Malawi.” If the policy is fully implemented “every person will have a basic right to information on improved sanitation and will have the responsibility to own and maintain sanitation facilities. It is the obligation of every person to take measures to promote sustainable utilisation and management of sanitation facilities. Children shall be given early exposure to hygiene and sanitation information. Women and men shall effectively participate in policy, programme, and project design and implementation to enhance their roles in hygiene and sanitation management activities. The recycling of liquid and solid wastes wherever

possible and appropriate shall be promoted. Appropriate re-use of by-products, shall be encouraged. The participation of the private sector, NGOs, and community-based organisations (CBOs) shall be promoted. Regulations shall be complemented by social and economic incentives to influence behavioural changes in individuals, institutions, and industries to invest in improved sanitation facilities. Hygiene and sanitation information shall be regularly disseminated. Every person shall be encouraged to wash their hands with clean running water and soap. Capacity building in hygiene and sanitation promotion shall be undertaken at all levels. Provision of water supply shall be integrated with hygiene and sanitation promotion. Adequate sanitation and hygiene promotion shall be the norm. There shall be an appropriate organisational framework and capacity building for hygiene and sanitation promotion” (Government of Malawi, 2007).

“Hygiene and sanitation research activities of various stakeholders shall be encouraged, but subject to monitoring and regulation. Industrial developments shall incorporate appropriate sanitation measures. Irresponsible disposal of litter, human excreta, or urine in public places shall be prohibited. Appropriate sanitary facilities shall be provided and safe hygiene practices promoted at all public gatherings. Health care waste shall not be mixed with other public waste and shall be disposed of separately. Adequate investment shall be made for hygiene and sanitation promotion. Provision of targeted subsidies for improved sanitation facilities for vulnerable and disadvantaged persons shall be promoted” (Champiti, 2008, National Sanitation Policy, 2007:8)

The National Sanitation Policy has an implementation plan which has the following components: “hygiene and sanitation at national level; hygiene and sanitation in rural areas; hygiene and sanitation promotion and delivery of services in cities, municipalities, towns, and market centres; hygiene and sanitation in schools; and hygiene and sanitation promotion in health care facilities”. The timeframe for the implementation of the plan was projected “to commence in 2008, be evaluated in 2012, and completed by 2020”. The institutions which are responsible for the implementation of the National Sanitation Policy includes “Ministry of Sanitation Affairs, the Ministry of Water Affairs, the Office of the President and Cabinet, water utilities, local assemblies, the Ministry of Natural

Resources, the Ministry of Health, the Ministry of Gender, Child Welfare and Community Development, the Ministry of Education, the Ministry of Lands, Housing, Physical Surveys and Human Settlements, other public stakeholders, NGOs, civil society, the private sector, and universities and other training institutions.” The Ministry of Sanitation is expected to “provide policy direction, coordinate hygiene and sanitation sub-sector programmes, prepare enabling legislation, provide regulatory frameworks for adequate sanitary facilities and hand washing facilities.” The institutions responsible for implementation includes the “water utilities that plan, design, rehabilitate, and construct infrastructures for wastewater collection, treatment, and disposal in their respective water areas in collaboration with local assemblies. They are also responsible for collecting, transporting, treating, and disposing of or recycling and re-using waste water, the promotion of improved on-site sanitation-facilities, the development and enforcement of waterwork by-laws related to the construction of delivery and connection facilities of services for water supply and waterborne sanitation in their water areas.” Local governments at “district, town, municipal, and city assembly levels are responsible for planning and coordinating the implementation of water and sanitation projects, and prohibiting indiscriminate urination, open defecation, and littering. However, service provision is undertaken by water utilities.” In instances where such functions had initially been performed by local government, “such functions are devolved to water utilities, and the management of sewerage systems and works transferred to water boards” (National Sanitation Policy, 2007:22).

The National Sanitation Policy provides definitions of key issues such as basic excreta sanitation which is defined as: “a facility without any hygienic features such as a tight fitting drophole cover, key shaped drop hole and foot rests that guide the appropriate positioning of the hole.” An acceptable facility “should allow for the safe disposal of faeces into a pit or receptacle where it may be safely stored, composted, or removed and disposed of safely elsewhere. It should also be safe to use, for example not in a dangerous state, liable to imminent collapse, or dangerously unhygienic. Toilet facilities should have doors and should offer users privacy. Another criteria is that the latrine pit or receptacle should be functional i.e. not full or over-flowing. The policy also states that the latrine

should be at least 30 metres from a ground water source or surface watercourse” (National Sanitation Policy, 2007).

The policy describes improved (excreta) sanitation as “having an impermeable floor and a tight fitting lid to the latrine, or in the case of ecological sanitation (ECOSAN) where no lid is needed, the ECOSAN latrine should be properly looked after with regular additions of soil, ash, and other organic material.” In the case of a water closet toilet, the definition of improved (excreta) sanitation “shall be limited to a utility that allows for the safe disposal of faeces into either a cesspit, a septic tank or a working sewer. The facility should offer privacy for the user. It should also be safe to use, for example not in a dangerous state, liable to imminent collapse or dangerously unhygienic.” The cesspit, septic tank or sewer should be functional i.e. “not full or overflowing in the case of a cesspit or septic tank, or blocked in the case of the sewer. A waterborne toilet facility must have a continuous source of water. In the case of waterborne sewerage, the whole system should be functional, including the treatment plant; otherwise a waterborne sewerage system merely shifts the problem elsewhere, where it may be polluting rivers or streams used by residents for other purposes such as washing clothes or bathing, and thus cannot be considered safe or indeed adequate” (Sanitation Policy, 2007).

The policy makes provision for hygienic and health promotion. One of the strategies highlighted is “hand washing after defecation, after handling infant’s faeces or soiled nappies, before preparing food, and before eating. In order to promote such practices functional hand washing facilities should be constructed in close proximity to each latrine or water closet with both soap and running water available. This is regarded as a benchmark for adequate sanitation improvement. Sanitation in the Malawi context comprises the principles and practices relating to the collection, removal, and hygienic disposal or recycling of human excreta, solid waste, and wastewater, as they impact on users, operators, and the environment.” The system or facility should be “acceptable and affordable to the user in addition to being structurally safe and offering privacy. At the household level this includes excreta, kitchen rubbish, water-supplies for cooking,

bathing, and washing clothes and household utensils, and any other discarded items” (The National Sanitation Policy, 2007).

6.6.5 Decentralisation policy and local government legislation

The decentralisation policy, developed in 1998, and the Local Government Act of 1998 devolve administration and political authority to district and municipal levels in order to promote popular participation. It is generally accepted that decentralisation promotes good governance and other democratic ideals by broadening access to and voice in governance institutions. Under a decentralised system, citizens are ideally given the opportunity to participate in policy-making and to hold elected representatives accountable (Ferguson and Mulwafu, 2004:6). Decentralisation policies assign certain responsibilities to district assemblies. One of the key tasks of decentralisation is to assist the government in the management and preservation of the environment and natural resources. Administratively, Malawi is divided into 28 districts, and each district subdivided into smaller administrative units. In most districts, more than 90% of the population reside in rural areas. The policy is useful for water resources management, as it supports the creation of different sectoral committees at all levels of the district, and it promotes the participation of different stakeholders. Decentralisation and planning for water supply and sanitation start at the village action plan (VAP) level. The plan crafted with the assistance of extension officers is then submitted to the area development committee (ADC) which in turn forwards it to the district coordination team (DCT) (Ferguson and Mulwafu, 2004:1, Weller, 2005:12, Mkandawire, et. al, 2011:10, NSO, 2011:2).

The district coordination team is the sub-committee of the district executive committee. The district coordination committee comprises district heads from the Ministries of Water Development, Health and Population, Women, Youth and Community Services, Natural Resources, and NGOs. The most senior official in the water sector at the district level is the district water officer. He or she is responsible for community-based planning and training, the supervision of works, and the monitoring of water supply projects. The district water officer works together with district development committees, which

comprise a Member of Parliament, traditional authorities, and representatives of business, women, and youth. There are no elected councillors and staff appointed by the district assemblies, but national department officials are seconded to work at the district level. This creates confusion regarding accountability at a district level. The district development committee is an executive committee of the district assembly. The district assembly allocates resources from the district development fund, based on projects suggested and prioritised in the Village Action Plan. In practice very few people participate in VAP processes, resources allocated are inadequate, and the allocation is based on political patronage. Most donor agencies implement projects without consulting the district assembly. The functionality, performance, and quality of water and sanitation services are supposed to be monitored by communities and village health and water committees on a monthly basis, but in practice this is not possible due to a lack of capacity in these structures.

Critically, the decentralisation of administrative functions is not accompanied by fiscal decentralisation; district assemblies have limited control over boreholes and other schemes. The accountability of structures is not clear, for instance the district water officer reports to the permanent secretary of the Ministry of Irrigation and Water Development, while in theory he or she is meant to report to the district assembly (Chunga, 2012, MIWD, 2007:23, Mkandawire, et. al, 2011:10, Welle, 2005:14). As a result of the funding shortfall, local government reform is supported by donors such as UNDP, DANIDA, and others. The national ministries are integrated into a single administrative entity that serves as a secretariat of the district assembly; in this manner heads of departments of national ministries at local level become subordinates of district commissioners and not their parent line ministry. Line ministries retain responsibility for policy formation, enforcement, standards and training, and assemblies are not allowed to take actions that contravene national policies. The Ministry Responsible for Water does not work hand-in-hand with the area or village development committee, the district development committee, and does not engage with the district state of the environment report, the district environmental action plan or the district environmental officers. Instead they choose to work through catchment management agencies (CMAs). If IWRM

is going to work, district environmental officers and district water officers should work together in crafting both the district state of water and environment reports (Chunga, 2012, Ferguson and Mulwafu, 2004:16).

The report released by the local development fund's Kalondololo Programme and the Youth Children Rights Shield (YOCRIS) on community satisfaction of service delivery under LDF projects in education, health, water, sanitation, and agriculture, highlighted the interference of council officials in the procurement of materials for LDF projects and the lack of elected councillors as the main contributory factors to the failure of local government system in Malawi:

Dedza District Council was accused of flouting procedures in the implementation of Local Development Fund (LDF) projects in which, out of 35 monitored projects for primary school teacher's houses, only one house was fully completed. Several houses remain uncompleted while others are already in dilapidated state, despite the project period elapsing and contractors claiming their pay. One official allegedly took away a cheque book from Magunditsa primary school committee and withdrew K300 000 which he told the villagers was to be used to pay for the bank charges of the committee's account. At Ntcheu primary school, another official took away 40 bags of cement in exchange for a solar energy panel which is part of the project. The solar panel was not delivered. The people who are responsible to sensitize committees on such issues and who should ensure that there is fiscal prudence in the committees were the ones who deliberately took advantage of the people and flouted procedure (Matonga, 2012b).

6.7 Environment and health

The implementation of IWRM is premised on the protection of the environment and the improvement of health. The quality of the water resources in Malawi is dependent on the chemical composition of the parent rocks existing in the area; the extent of agricultural activities (application of agrochemicals, farming practices, land husbandry); and the disposal of industrial waste products as well as human sewage, particularly in urban areas (Mkandawire, et. al, 2011:2).

Generally, both surface water and groundwater are sometimes unsuitable for human consumption. The absence of industries and the small size of the cities mean that chemical pollution of water sources from industrial activity is not a major problem in Malawi. However, due to recently increased agricultural activities there has been considerable degradation of water sources as a result of increased siltation in rivers and reservoirs. The industrial sector is also responsible for the degradation of water quality through the dumping of waste into rivers and streams, as is evident by the present state of the Mudi River in Blantyre and the Lilongwe River in Lilongwe. In 1999 Ng'ong'ola (1999:13) concluded that rivers in Malawi have a very poor microbiological quality due to faecal coliform. The Mudi River in Blantyre is heavily polluted, with faecal bacteria counts as high as 20,000 faecal coliforms per 100 millimetres. Accumulated sludge from pit latrines and septic tanks is often also not removed, leading to overflow problems in sewerage systems that suffer from operational problems associated with vandalism, lack of spare parts, obsolete parts, and old age. Effluents consisting of human waste are discharged into river systems and the absence of a scoring system makes testing water quality difficult. Other river health issues involve turbidity, siltation caused by soil erosion, and high suspended solids content. Major rivers used for abstraction of potable water carry suspended solids in excess of the World Health Organisation guidelines for drinking water (Ng'ong'ola, 1999, 13).

This is most severe in areas under immense population pressure, resulting in serious deforestation and the cultivation of marginal and other fragile areas. Groundwater is more mineralised in alluvial aquifers than in the weathered basement aquifers. Areas such as the lower Shire valley, the eastern Bwanje valley and around Lake Chilwa, have saline waters. The utilisation of groundwater in such areas is thus limited due to high contents of iron, fluoride, sulphates, nitrates, and total dissolved solids (TDS). There are known occurrences of fluorides and sulphides in groundwater in some areas along the lakeshore plains, and in the lower Shire. Water quality problems such as arsenic contamination which causes great difficulties elsewhere, are also a problem in Malawi. The appearance and smell of water from the Mpira Balaka Dam which feeds the Mpira/Balaka water

supply scheme, has been affected by algal blooms. This contamination of water resources results from treated industrial effluents that contain heavy metals such as zinc, copper, and mercury. These metals are used in paints, plumbing, and pesticides, accumulate in food chains, and persist in the ecosystem. The poor quality of water in the Mpira Balaka water supply scheme has resulted in increased costs of treatment and purification. One of the purification plants ran out of chlorine for months (Ng'ongo'la, 1999, 13, Ferguson and Mulwafu, 2004:4, WaterAid, 2005:5, Mkandawire, et. al, 2011:8, Chipofya, et. al, 2010:266).

Irrigation development in Malawi has not had very serious negative environmental impacts. Most of the areas that have been developed for irrigation have for as long as people can remember been considered waterlogged during most of the year. As a result the impact of irrigation development in terms of waterlogging is minimal (Mkandawire et. al, 2011:8, Chipofya, et. al, 2010:266).

Water-related vector-borne diseases such as malaria, typhoid, cholera, and bilharzia have infected most people around the irrigation schemes in Malawi. Malaria continues to kill as many people as AIDS but is far less publicised, perhaps because most victims are infants. Drug-resistant strains are spreading fast. Public interventions such as drainage and spraying are much less effective than a generation ago, though the use of bed nets treated with insecticide is increasing. Malaria is one of the leading causes of death in developing countries. The Malawi Demographic and Health Survey 2010 (2011:25) highlights that 66% of rural and 75% of urban households own mosquito nets, with only 55% possessing insecticide-treated nets. Only 42% of rural pregnant women have ever used insecticide-treated nets and only 42% of children under the age of five with fever have previously taken antimalarial drugs (NSO, 2011:28).

Malaria accounted for 55% of those that reported having been sick. The results further show that malaria is by far the most serious health threat in Malawi, regardless of gender and place of residence. Urban households experienced slightly fewer cases of malaria compared to rural households: 45% and 46% respectively (NSO, 2009:21). In 2009 about

58% and 21% of people suffered from malaria and diarrhoea in Ntcheu, 58% and 23% in Balaka and 59% and 9% in the Mangochi districts (NSO, 2009:24). Cholera is endemic in this part of Africa, and flares up in Malawi during the rainy season in most years. It attracts the media and frightens the politicians who allocate money for curative work while neglecting preventative measures such as better sanitation and hygiene promotion that could subdue the threat over the longer term. Actual cholera deaths are few compared to the ongoing toll of other diarrhoeal diseases that attract minimal publicity or political interest (Water Aid, 2005:3, Chipofya, et. al, 2010:262, NSO, 2011:25).

In order to reduce the spread and intensification of such diseases, most of the schemes, and particularly those operated by the government, include a water supply and sanitation component to provide for potable water through the sinking of boreholes and proper sanitation facilities. In addition, health clinic facilities provide treatment to the affected population as well as health and hygiene education. However, there are quite a number of schemes, and especially self-help schemes, where such facilities are lacking. Development of land and related resources have not been guided by policies and strategies that protect water resources against physical, biological, and chemical degradation and pollution (Ng'ong'ola, 1999, 13, Water Aid, 2005).

6.8 Challenges of meeting the MDGs and ensuring sustainability

According to recent assessments, only about 3% of Malawi's population has a piped water supply outside their dwelling unit. Nearly 46% of the population obtains water from communal hand pumps followed by 23% from communal unprotected wells. The remaining 28% of the population obtains water from communal standpipes, wells, springs, and rivers. This means that about 15,000 new communal water points will be required to meet the water MDG and 1.2 million improved latrines to meet the sanitation MDG target by 2015 (Water Aid, 2008). In Malawi, safe or improved water sources include boreholes, community standpipes, protected wells, and tap water piped into dwelling units or compounds. Safe or improved sanitation is defined as the use of toilet facilities that flush to sewer, are ventilated improved pit latrines, or covered pit latrine. The facilities were not classified according to service level standards (NSO, 2009: 64).

In urban centres and towns where water is supplied by the two city water boards and the three regional water boards, the average coverage level is estimated to be at around 80% - 94%. However, there is a significant challenge in maintaining these aging systems to ensure sustainability as the urban population, especially in the low income and peri-urban areas, keeps growing. Water cuts that sometimes last up to three days have become a way of life in Malawi's commercial hub, Blantyre. Adding to residents' woes, the para-statal Blantyre Water Board (BWB), the city's sole water supplier, has warned that the cuts are likely to persist until 2013 as it is replacing dilapidated water pumps with new equipment. Businesses in Blantyre have resorted to installing on-site water tanks in an effort to cope with the erratic water supply. The BWB's ability to cope with demand is also being outpaced by the growth of Blantyre. The utility is able to pump 75 000m² of water daily against a demand for 95 000m². The water shortages in Blantyre has led to the suspension of BWB's CEO Owen Kankhulungo in November 2007. A press statement signed by the utility's board chairman, Tarsizius Nampota, stated that Kankhulungo had been suspended ahead of investigations into the causes of the water shortages. Before his suspension, Kankhulungo said that the shortages were a direct result of the water system being both inadequately maintained and over-utilised. He has since been quietly reinstated (WISA, 2008).

The market centres and small rural towns also require special attention to provide new and appropriate water infrastructures to exploit their economic growth potential. Currently most of these centres are served by communal water points or traditional water sources that are inadequate and unsuitable for the concentrated population (World Bank, 2007:4). The other challenge is that schools were cut off by utilities because they were unable to pay their water bills. According to Banda (2007) in the first six months of the year, more than 124,000 pupils had to use bushes around their schools to relieve themselves because Blantyre's Water Board disconnected the water supply at 22 schools due to the government's failure to pay bills. Permanent Education Secretary Anthony Livuza had to plead with the Water Board to reconnect the water supply to avert an outbreak of diseases in the schools. The water supply company eventually reconnected

the water, but asked the Ministry to speed up paying for the service. The water cut-offs that schools experience contribute to the high rate of school dropouts by girls who find it difficult to continue schooling, especially during their menstrual cycle, if there is no water. It is interesting to note that permanent secretaries are board members yet when it comes to disconnections they are powerless to put a stop to them, whilst schools suffer (World Bank, 2007, WISA, 2008, Banda, 2007).

Government statistics in Malawi show that 10.5% of girls drop out of school each year as compared to 8.4% of boys in 2007. In addition to this, around 22% of primary school age girls do not attend school at all, while 60% of those enrolled do not attend regularly (Banda, 2007, World Bank, 2007, MIWD, 2008, Government of Malawi, 2008). The latest statistics show that 5% of secondary school students had dropped out of school in Malawi. There were smaller differences between males and females drop-out rates, (5% against 6%), and the lower or higher the educational level of the household head contributes to access to schooling or lack thereof. In rural areas, 6% and 3% of girls and boys dropped out of school, respectively in 2008 (NSO, 2009:36).

6.8.1 Water and sanitation coverage

Water and sanitation coverage statistics for Malawi are uncertain. Although the JMP has changed from using supply-side data to household surveys which has resulted in a decrease in these figures, even these may be over-estimates. The apparently high urban water figure masks the situation in unplanned peri-urban settlements where public tap stands serve large numbers of people with a paltry and unreliable supply. The rural water figure has increased significantly since 1990, and may fail to properly account for the significant percentage of constructed facilities that do not actually work. An on-going national water point mapping project in which NGOs such as Water Aid has been involved, points to a rural water coverage of 57% (Water Aid, 2008). The WHO/UNICEF Joint Monitoring Programme's (JMP) figures for 2006 are as follows:

Table 6.5 Malawi water data

	Population			water supply coverage (%)					
	Total	%	%	Total	Urban		Rural		
	(x1000)	Urban	Rural	Total	HC	Total	H C	total	HC
1990	9,459	12	88	40	7	90	44	33	2
1995	10,111	13	87	52	7	93	39	46	2
2000	11,512	15	85	64	7	96	34	58	2
2004	12,608	17	83	73	7	98	29	68	2

Source: WHO and UNICEF, 2008

Table 6.6 Malawi sanitation data

	Population			sanitation coverage (%)					
	Total	%	%	Total	Urban		Rural		
	(x1000)	Urban	rural	Total	HC	total	HC	Total	HC
1990	9,459	12	88	47	0	64	4	45	0
1995	10,111	13	87	53	0	63	3	51	0
2000	11,512	15	85	58	1	63	2	57	1
2004	12,608	17	83	61	1	62	1	61	1

Source: WHO/ UNICEF, 2008

The usefulness of the sanitation figures depend on the definition of adequate sanitation. Almost all facilities in Malawi are pit latrines, the majority of which are merely holes in the ground. With some sort of squatting arrangement, they are inadequate to prevent faecal-oral disease transmissions. The JMP recognises this and has halved its previous estimates to arrive at the above figures. However some sector agencies estimate only 15-30% rural coverage of adequate sanitation. Meanwhile some documents continue to quote the previous official figures of over 70% coverage. This uncertainty in coverage estimates is very significant because, if external support agencies rely on the official sanitation figures, they may not see Malawi as a priority country.

Awareness of personal hygiene issues is low and probably linked to low literacy rates, but the government and other agencies are trying to improve hygiene promotion in communities and schools. The latest figures presented by National Statistical Office (2009:64) in The Welfare Monitoring Survey in which 18,000 households participated

show high levels of improvement. The survey results show that 80% of the households in Malawi had access to safe water. The number of urban households with access to safe water is 94% whilst rural households are estimated at 78% (NSO, 2009: 64). The number of households in Ntcheu, Balaka and Mangochi are estimated at 78%, 86% and 91% respectively.

The time taken to get to the nearest supply of drinking water is estimated to be between 0-14 minutes for about 81% of Ntcheu households, 81% of Balaka households and 92% of Mangochi households respectively. Very few households spent 15-30 minutes walking to the nearest water point in all three areas. In Ntcheu about 17%, in Balaka about 15% and in Mangochi only 7% of households took less than 30 minutes walking to the nearest water point. No households that participated in a survey stated that they spent neither about 60 minutes nor 45-59 minutes walking to the nearest water point in all three areas (NSO, 2009: 77).

According to the Malawi Enhanced Structural Adjustment Facility Policy Framework Paper (1998/ 1999-2000/01) in the water sector, despite Malawi's abundant resources, only 47% of urban households have access to clean water. The situation in rural areas is worse. To reduce the dependence of the population on rainfall and unprotected wells, the government will continue to take measures to rehabilitate and construct groundwater basal systems and protect dams and reservoirs. Furthermore, to augment the supply of clean water, the government is implementing a national water development project totalling US\$94 million and is also engaged in a nationwide initiative to construct boreholes. As a result of these initiatives, the government anticipates that 67% of all households will have access to clean water by 2001 (IMF, 2000, Water Aid, 2008).

This water and sanitation supply situation projected in the 2000s remains the same in terms of service level standards despite a move towards the implementation of IWRM which gained momentum in 2008. In 2008 another study estimated that 4 457 000 rural people are without access, whereas in urban centres the number of people with access were estimated at 1 332 000, with 254 000 households lacking access. The backlog to

meet MDGs is estimated at 2 355 500 (Lopez, et. al, 2008:4). The rural households who have access to water are served either with boreholes or shallow wells whereas urban areas are served with piped water and communal standpipes.

Moreover, the government intends to raise the share of community-based management of rural water supply to 75% by the end of 2013 from its current level of under 30%. To this end it will decentralise rural water provision by contracting out drilling and construction, by having private agencies assist in training communities to assume responsibility for water, and by enabling local communities to contract construction work with private operators. The government will seek to ensure financial viability through the establishment of appropriate tariffs and that each of the five water boards fully recover costs, and discourage water wasting associated with the provision of free water. This statement indicates that the cost recovery, decentralisation, and commercialisation of water boards are external influences imposed by donors, and that the government of Malawi has neither influence nor control over it (World Bank, 2007).

6.8.2 Obstacles to access to safe water, adequate sanitation and hygiene

6.8.2.1 People who lack access

Despite the coverage figures described in the section above, the number of Malawians without access to safe water and sanitation are vast. Four million Malawians (40%) living in rural areas lack access to safe water. In the subsistence rural economy, the people are not necessarily the poorest but may have the least political or social influence (including woman- and child-headed households), or live the furthest away from accessible roads. It is estimated that over seven million Malawians (70-80%) living in rural areas lack adequate sanitation and hygiene. They constitute the vast majority of rural dwellers, not any particular subgroup. Up to half a million Malawians (25%) living in urban and peri-urban areas lack sufficient access to affordable safe water. They may be nominally served by public tap-stands, but are constrained by distance, queues, tariffs, or cut-offs from the utility. In the cash-based urban economy, people who lack water are generally the poorest section of the urban population, ironically, because they are the most reliable customers

who pay cash for water as they use it. Up to one million Malawians (50%) living in urban and peri-urban areas lack adequate sanitation and hygiene services. They are the poorest people in the cities and unplanned urban settlements (Water Aid, 2008).

6.8.2.2 Reasons why people lack access

Weak sectoral leadership and coordination

Leadership in the sector is weak and national level water coordination mechanisms only function intermittently. They do not encompass all the organisations in the sector. Sector leaders have not succeeded in placing water prominently in the Malawi PRSP, and as a result external financing agencies have either withdrawn their support or do not invest much money in the sector. There is no lead ministry and no national policy on sanitation, although the MoIWD has recently been designated to lead in sanitation policy development. Each agency consequently follows its own guidelines and practices. Even where policies exist, for example in water supply and resources management, they are weakly disseminated and enforced. In Poverty Reduction Strategy Papers, water and sanitation are placed under the Infrastructure Group which is dominated by engineers, and water rights are reduced to technical and engineering experiments with dams and pipes (MEJN and Water Aid Malawi, 2005).

Poor sustainability of services

Historically people have been dependent on the government for the maintenance of water resources (see more on results in the next section). More recently though the government has ceased to assume this responsibility, and the people feel disillusioned and unwilling to exercise ownership and maintenance of water services. Agencies offer communities a limited choice of technologies; typically only one or two types of solutions to their water or sanitation needs. Inappropriate technologies are used; most commonly boreholes are installed where shallow wells would be cheaper and more sustainable. Equipment such as pumps and pipes for which spare parts are only intermittently available because of unreliable distribution mechanisms, are used across the country.

At the local level, powerful people may affect sustainability by abusing their power. For example, leaders allocate facilities such as water points for political purposes and not according to need. Secondly, water point committee members and traditional leaders misuse the maintenance funds raised from community contributions, and fail to account for it so people stop contributing money. There are equally a lot of system breakdowns and poor maintenance that results in the infrastructures provided no longer functioning. The Malawi Economic Justice Network and Water Aid (2005) noted that in 1998 48% of the population had access to water supplied from 11,800 boreholes; 5,000 had protected shallow wells, 66 rural gravity fed supply schemes and 55 urban water supply schemes. By 2001, access to portable water supply faced a reduction to 32% due to breakdowns and water sources drying up, as well as problems of operation and maintenance. The IWRM concepts of community management, decentralisation, and recognition of water as an economic good, are responsible for system breakdowns and a reduction in the number of people who have access when shallow wells dry up and existing infrastructures are poorly maintained and operated. Some of the system breakdowns are caused by poor workmanship and substandard quality control (Brikke and Rojas, 2001:6, MEJC and Water Aid, 2005).

Poverty information

Official water and sanitation coverage figures are erroneously high and mask the true extent of the need. Definitions of access to safe water and adequate sanitation are not agreed upon by various water and sanitation agencies. People who lack water, sanitation, and hygiene services simply do not know what to request, or from whom. Many people are illiterate and unable to learn about the importance of water, sanitation, and hygiene, or learn how to participate in community-based water resources management. Further, sanitation and hygiene are not subjects that are traditionally discussed in most people's cultures or way of life. There are other cultural barriers: pregnant women may fear to use latrines, and daughters-in-law may be forbidden to use the same latrines as their fathers-in-law. People steal whole borehole pumps, taps, or parts of pumps to sell or apply in other uses. They may also vandalise their own or other people's facilities for reasons that are difficult to understand but probably stem from a lack of awareness of community

needs. Against the background of devolution and decentralisation, the district reports received by regional offices are erratic and incomprehensive. Welle (2005:13) cites an example of a borehole database that MoIWD has never completed, and donor-funded water points that have never been reported in national and regional databases. There has been some improvement in reporting MDGs with the introduction of the Malawi Socio-Economic Database (MASEDA) at the National Statistical Office, the publication of the Population and Housing Census in 2008, the Malawi Demographic and Health Survey (2002-2009), and the publication of the Welfare Monitoring Survey (2005-2010) (Brikke and Rojas, 2001:13, Welle, 2005:13, NSO, 2008, NSO, 2009, NSO, 2010).

Financial poverty of the people

People cannot afford to make the capital contributions that most agencies request for water supplies, the material costs for sanitation, or the water tariffs in urban areas. People living with chronic conditions such as HIV/AIDS and relatives who provide care for them are unable to work to relieve their poverty. It is a fact that even NGOs require communities to collect about K15 000 00 prior to the installation of boreholes, and those that are unable to contribute towards the installations costs are excluded. In addition to installation costs, households are also expected to contribute K200 per month for maintenance and buying spares. In the next section of this chapter the experiences of various tap and borehole committees regarding installation, operation, and maintenance costs will be further elaborated (Water Aid, 2008, Brikke and Rojas, 2001:14, Focus Group Discussion 2012).

Limited capacity in the water sector

There are inadequate numbers of trained experienced professional people to fill the posts in the sector agencies. Due to a shortage of skilled supervisors, the quality of construction work is variable or poor. Boreholes are not built to the correct depths or specifications, and hence quickly fail. The water sector remains in a junior position compared to other ministries, and lack of strategic direction; and high staff, ministerial, and permanent secretary turnover hinders the development of coherent strategies. Institutions such as the area development committee, district coordination team, district executive committee,

district development committee, and district development fund lack financial and technical resources. Even the upgrading of the Department of Water Development at district level into a full ministry faced many delays; district water officers remained junior to other senior local government executives, and at some stage a district water officer position was for many years filled by artisans instead of university graduates. In the Malawi Poverty Reduction Strategy Paper 2006 Annual Report (IMF, 2006:23) it was reported that communities were mobilised and trained on how to operate, manage, and maintain water supply systems, environmental, and water catchment protection through the National Water Development Project, the Lilongwe/ Dedza Ground Water Project, the District Water Supply III Project, and other World Bank funded projects. UNICEF and WES NGOs implemented the construction of boreholes, shallow wells and springs, trained extension staff in participatory hygiene and sanitation transformation (PHAST), and Village Health and Water Committees in PHAST and Community Based Management of water and sanitation facilities. All these initiatives were geared towards increasing capacity in water resource management, water supply, and sanitation (Welle, 2005:14, IMF, 2006:23).

Hydrological, climatic and geographic challenges

Malawi's climate is dry and increasingly unpredictable, with surface and groundwater resources becoming depleted. Catchments are degraded, typically by uncontrolled deforestation for cultivation, firewood, and timber. Spring and stream sources for gravity-flow supplies are drying up. Persistent drought over past years has caused low recharge in groundwater aquifers leading to the lowering of water tables necessitating rehabilitation and re-deepening of boreholes. The sustainability of water supplies is threatened as sources dry up during the dry season in some areas. Water disaster management, flood attenuation and mitigation, early warning systems, river health, and drought preparedness are some of the initiatives that the governments of Tanzania and Malawi are implementing through the Songwe River Commission (Dukuduku, 2002:4, World Bank, 2007a:2).

There is very poor road access in many rural areas which means that field workers and construction vehicles and equipment cannot travel to the communities who need water. Sandy soils along the heavily-populated lakeshore areas, cause latrine pits to collapse while rocky conditions in many hill areas prevent pit digging. Unplanned urban settlements have neither legal land tenure nor provision for water supply reticulation networks, drainage systems, or safe sanitation (Water Aid Malawi, 2005: 11).

6.9 IWRM implementation in Malawi

One of the key principles of IWRM is the participation of all stakeholders. It has been established that when developing the PRSP, NGOs working in the sector were not consulted; Save the Children, Concern Universal, Freshwater, Water Aid, Inter Aid, Africare, CPAR, CCAP, CSC, World Vision, and ADRA did not participate. Instead eight chiefs, one police official, three headmen, nine members of line ministries, two councillors, one church representative, and the head of the Malawi Social Action Fund participated in consultations in Salima. Such mistakes were corrected when an IWRM and Water Efficiency plan was crafted from 2008 up to 2010 (Lopez, et. al, 2008:2).

There is a general lack of data that could support the implementation of IWRM in Malawi. This was noted even during the UDF administration. Mrs. H.G. Kawalewale, Secretary for Water Development noted in November 1999:

“One problem is the lack of sectoral coordination, resulting in uneven distribution and coverage of systems and duplication of efforts. There seems to be lack of proper documentation on the sector’s activities. A lot of activities were taking place by various players and some were not properly documented. There is a need for the ministry to develop a well-planned water monitoring system to cover all the activities of all water actors.”

All the good suggestions from Mrs Kawalewale have been anticipated in the current policies and strategies. Even Ken Grey of UNICEF noted in 1999:

“Without sufficient data on existing water supply installations or support for rehabilitations, some areas will continue to receive new installations again and again, while other less politically influential areas will receive no services”.

The development of a comprehensive water sources database would help remove the inequities, ensure more transparent allocation, and move towards the more effective use of limited resources which should be regarded as a high priority for the PRSP.

It has been established that poor communities do not participate in technology choices and therefore certain types of technologies are imposed on them by Tinkwere House. Achieving a sustainable water supply is impossible if only one type of technology for groundwater extraction is promoted. The reliability of the spare part supply, combined with the ability of communities to collect money to carry out major repairs, and the capacity within districts to carry out repairs that are beyond the capacity of the community, are some of the problems experienced in using boreholes. A change in government administration leads to those coming into power simply trying to reinvent the wheel. The National Water Implementation Manual of 1999 is ignored in the water sector. Even the Ministry of Irrigation and Water Development has no mechanisms to enforce the use of NWIM by all water actors. The districts lack capacity to plan and manage water and sanitation in the districts, and the MIWD is blamed for ignoring NWIM when they implemented the 3000 borehole project, for instance.

According to De Gabrielle (2002) who studied VLOM in Malawi the following are major challenges:

“Weak water policy, and incoherent sanitation policy, outdated sector development guidelines, ineffective regulations and enforcement, low profile of hygiene education, weak planning, unsafe disposal of solid and liquid waste, gender inequality, inadequate training of extension officers on improved hygiene and environment promotion are bottlenecks facing IWRM in Malawi”.

By 2001 safe sanitation coverage was less than 10%, and even areas with good water supply provision did not experience a reduction in diarrheal diseases. The then Principal Secretary for Water Development Dr. C B Chizonda stated the following in his closing remarks during the World Commission on Dams Workshop in 2004:

“There is a need to develop guidelines and standards on dams, set up a dam coordinating institution such as a National Water Resources Authority, revisit dams development policy in order to encompass all instruments required to effectively and efficiently develop and manage our dams”.

In addition there is a need to check the status of the 749 small dams and 9 large dams in terms of decommissioning or rehabilitation. Once the status of existing resources is confirmed, it is imperative that all stakeholders participate in managing water resources in a holistic and sustainable manner. It is imperative that the capacity of local government structures is built and strengthened, that necessary financial resources are made available, and that water authorities be linked with local government structures other than water boards. This task could be linked to adopting a river basin as a unit for water resources management and establishment of river basin authorities such as Mpira Balaka Water Authority. Key areas of interventions required in strengthening water resources management are: the promotion of rural community organisations and rural potable water supply and sanitation, urban and peri-urban water supply, enhancing catchment conservation and river bank protection, safeguarding water quality, improving water resources data collection and analysis, and improving storage and dissemination. The upgrading of water quality gauging stations and the establishing of new ones is also essential. Guidelines for industrial effluent discharge should be reviewed, and mechanisms for monitoring and enforcing safe discharge levels should be formulated. A river health programme should be promoted together with water quality improvement strategies. Water quality monitoring by rural communities and technical tools such as a mini scoring system to test water quality that communities can use should be promoted (Ng’ong’ola, 1999: 29, Lopez, et. al, 2008:8).

6.10 Emerging themes

6.10.1 Water and sanitation governance

The water sector leader in Malawi is the Ministry of Irrigation and Water Development and its key role is to facilitate the development of water resources in the country. In discharging its water resources functions, the Minister established the National Water Resources Authority in accordance with The Water Resources Act of 1969. The National Water Resources Authority is responsible for granting water rights for abstractions and the discharge of effluents as well as for monitoring adherence to water rights. At Balaka, Ntcheu, and Mangochi, water and abstraction rights are granted through the local office of the National Water Resources Authority, namely the Mpira Water Authority which is a catchment management authority. The Mpira Water Authority is governed by a board of trustees appointed by the Minister of Irrigation and Water Development, and managed by the CEO and government employees seconded from the Ministry. The current CEO is Aaron Mabira who also acts as the district water development officer responsible for the Balaka, Ntcheu, and Mangochi districts. In future each district will appoint its own water development officer who will represent the authority in each of the district assemblies. The board of trustees represents the interests of the water user associations (WUAs) and traditional authorities such as Makwangala, Champiti, Ganya, and Pambala in the Ntcheu district (Interview with Aaron Mabira on 20 August 2012).

The Mpira Water Authority is constituted of catchment committees, water point committees, and area committees. There is at least one WUA in each of the water and sanitation schemes managed by the authority. The WUA is responsible for managing water and sanitation schemes, collecting tariffs from users, mobilising communities within the catchment area, and contributing towards the operation and maintenance of the scheme. WUAs work with local authorities in the operation and maintenance of schemes. They are assisted by the Ministry of Irrigation and Water Development if the operation and maintenance work is major, but there is no capacity to conduct such work within catchment areas. The WUAs are also responsible for monitoring water quality in various water resources, but the day-to-day functions are performed by state employees on its

behalf. Once a full staff compliment is appointed in the Mpira Water Authority they will be responsible for the collection of revenue as well as monitoring water quality. The Southern Regional Water Board is responsible for water reticulation in the urban areas of Ntcheu, Balaka, and Mangochi, whereas the Mpira Water Authority is responsible for water resource development and reticulation in rural areas in the above districts (Interview with Aaron Mabira on 20 August 2012).

Decision-making on water developments rests with the Ministry of Irrigation and Water Development, the Mpira Water Authority and the Southern Regional Water Board that operate at meso and formal levels, whilst informal and micro institutions such as traditional authorities and water user associations are also consulted. This institutional arrangement is based on the Water Resources Act of 1969 and the Water Works Act of 1995 at a formal level of water governance whereas the informal rules are embedded in the cultural and social milieu of the community (Livingston, 2005:22, Klein, 1999:463, Nabli and Nugent, 1989:1334).

Communities served by the Mpira Water Authority consistently had access to water while those served by the Southern Regional Water Board did not have access to water for more than three months after the water board instituted water rationing. Households living in the Kandengwe Village outside Balaka reported that there were instances when water only starts flowing at 1am, and the times in which water is scheduled to flow after a mechanical cut-off is not known. Sometimes they wake up at 12 midnight to collect water, only to discover that there is nothing. According to Mathews Chigamba, an official in charge of the Southern Regional Water Board's Balaka water treatment plant, households in Balaka access water between 9 am and 12pm, and 11- 2pm whilst Liwonde households access water between 2pm -3pm and 3- 9pm, and disputed the claim that water only starts to flow during the night and that there are times when households do not get access to water at all for a whole month (Interview with Mathews Chigamba on 20 August 2012, Household Interviews).

The reasons for water rationing, according to the Southern Regional Water Board, is that the Mpira Water Authority does not allow them to buy enough bulk water to reticulate to the various users served by the water board. Water rationing is meant to ensure that all households get access to water. The CEO of the Mpira Water Authority indicated that water rationing as well as low water pressure resulted in the Balaka District Hospital opting to build their own pump station, to connect directly from the water authority, and to stop their Southern Regional Water Board connection, and that these problems are associated with the relationship between the water board and the hospital; the authority is not involved. He confirmed that the water authority took over from the water board to ensure that critical wards such as theatres and intensive care units have sustainable access to water. It is clear however that rationing and low water pressure is not a technical problem but an institutional and market-related problem. Even the disconnection of households unable to pay for water is exclusively found in the areas managed by the Southern Regional Water Board; the households using water served through the Mpira Water Authority never experience water disconnections (Castro, 2007:98, Chigamba and Mabira Interview, 2012).

Mathews Chigamba confirmed that the Southern Regional Water Board disconnects households to encourage a culture of payment, that they do not have an indigent policy, and that no subsidies are provided to poor households. Local respondent Aaron Mabira argued that the Mpira Water Authority intervenes if water is wasted at a communal water point which only costs K50 per household per month, whereas households served by Southern Regional Water Board pay between K2000-4000 per month and that is why disconnections are common. The different tariff systems and different views on limiting access to water through rationing and disconnections by both the Southern Regional Water Board and the Mpira Water Authority is a reflection of institutional failure manifested in markets, bureaucracies, redistribution, and remediableness (Williamson, 2000:183).

The Southern Regional Water Board views water as a commercial commodity whereas the Mpira Water Authority views water as a social and a public good. These two state

institutions are caught up in hydropolitics and the fact that rationing and disconnections are viewed as techno-scientific solutions which erode institutional thought and socio-political paradigms of water and sanitation governance. The Mpira Water Authority engages water users through a process of substantive democratic participation in the form of traditional authorities, water user associations, tap committees and other local actors, whereas the Southern Regional Water Board do not engage stakeholders at all (Interview with Mabira and Chigamba on 20 August 2012).

6.10.9 Collective action

State institutions, NGOs, and communities are bridging the gap between the techno-scientific, socio-political, economic, and cultural aspects of water and sanitation governance. They are pursuing collective action that may be difficult for individuals to achieve acting on their own. Declaring areas open defecation free, providing households with chlorine to prevent waterborne diseases, and moving away from the service of a commercialised water board, are some of the examples of collective action taken by stakeholders in Malawi (Rogers, 2002:4, Bromley, 1978:46, Nabli and Nugent, 1989:1338).

There is also evidence of collective action in rural areas where communities use WUA structures to engage the Mpira Water Authority on water rights. The Balaka District Hospital refused to pay the Southern Regional Water Board because of the low pressure water supply in the main pipeline from Mpira to Liwonde which resulted in critical wards such as theatre and intensive care unit lacking access to water. They resorted to digging a borehole which is expensive because it involves removing salt from the water, and negotiated with the Mpira Water Authority for a transfer from the Southern Regional Water Board connection to the water authority's scheme. All primary health care centres in Kalembo, Mbera, Nandombo, Namenolo, Ulongwe, Kwitembo, Chienda Usilwo, Utale 1, Utale 2, Kankao, Phimbi, Pharula, Katshenga, and the Outpatients Department in Balaka were transferred from the Southern Regional Water Board to the Mpira Water

Authority to ensure sustainable access to water of good quality and high pressure (Limbe, Interview, 2012).

The collective action embarked upon by the Balaka District Hospital, together with the primary health care centres which refer patients to this hospital, was influenced by water rationing in most areas served through the Southern Regional Water Board and high incidences of cholera reported in the district due to lack of access to water and related hygiene promotion. The district hospital proposed abstracting water directly from the Shire River and reticulating it to all primary health care centres. The reason the Mpira Dam built on the Mpira River was chosen is because areas such as Katshenga which is located 70km away from the Mpira Dam has access to water while Balaka and Ntcheu are subjected to rationing by the Southern Regional Water Board. The hospital has the capacity to abstract water and operate pump stations that can increase water pressure in all primary health care centres. Water drawn from boreholes is not treated as there are no treatment facilities in health care centres. Only the Mbera clinic has access to adequate water in the correct high pressure because it is connected directly to the Mpira Dam through the Mpira Water Authority. This act of collective action by the Balaka District Hospital illustrate Rogers's (2002:4) assertion that interest groups with a stake in water use and allocations can meet their individual objectives in an existing structure of rights and laws and seek to change the rules which govern water and sanitation services in a manner that promotes their group interests.

When the Deputy Minister of Health, Mrs Halima Dauda, visited the Balaka District Hospital on 10 August 2012, the meeting with hospital officials was dominated by water resource management issues. The state of the hospital facilities were so poor, that a pregnant woman gave birth in a toilet due to a lack of beds in the Ntcheu District Hospital (Malawi Broadcasting Corporation, News bulletins, 10 August 2012, Limbe, Interview, 13 August 2012). In 2012, the Balaka and Ntcheu Hospitals were in the process of working with Water Missions to ensure that water abstracted through boreholes is treated before it is consumed by patients. The social capital achieved through changing a water allocation from a water board to a water authority is a reduction in the instances of

cholera which have dominated Balaka in the past 3 years (Limbe, Interview, 13 August 2012, Livingston, 2005:24, Williamson, 2000:147).

The environmental health department of the Balaka District Hospital is working with NGOs such as World Vision and Concerned Universal to deal with open defecation in the district. The programme entails dealing with waterborne diseases such as cholera and dysentery, water-based diseases such as malaria, and watershed diseases such as scabies and other skin infections. The NGOs and the district hospital distribute tins of chlorine to households to treat water from unprotected sources in seasons when water rationing results in a lack of access. The chlorine powder is mixed with 20 litres of water; 1 teaspoon per 20 litre drum is kept for two weeks whereafter households are given additional bags of chlorine (Nindi Interview, 13 August 2012).

The Department of Health is also working with NGOs such as Go Malawi, World Vision and Concerned Universal in promoting community led total sanitation (CLTS) in 12 schools within the Balaka district. The district coordinating committee meets every two weeks to monitor open defecation in schools and the broader community (Nindi Interview, 13 August 2012). This initiative which is reducing the prevalence of waterborne diseases associated with open defecation and promoting school attendance by girl children, is premised on public or collective action goods that bring about joint benefits to society and also give voice, joint use, and public and common property rights to all regardless of wealth, power and social status (Nabli and Nugent, 1989, 1339).

6.10.3 Principles of water and sanitation governance

The principles of water and sanitation governance will be elaborated on in the section below. Participants in the study raised concerns about the lack of openness, communication, and transparency on the part of the Southern Regional Water Board in terms of rationing and disconnections. In the village of Ntonya, households connected to the SRWB did not have access to water for three months, whilst their neighbours have continuous access to public water points provided for by the Mpira Water Authority. Even at Kandengwe Village, households connected to the SRWB did not have access to

water for four months, whilst within the same village, those who got water through the authority continued to have access without interruption. Throughout these months of drought in the SRWB pipes, no meetings were convened to explain the problem to households. No notices were served to the communities advising them when the rationing and disconnection would end (Focus Group Discussion notes taken on 11 August 2012).

In community No. 8 in the Kandengwe Village, a participant in a focus group discussion stated:

“Water bills compiled by SRWB took more than three months to be delivered to them and there are no user platforms they can use to raise their concerns with the water board.”

Lack of communication, transparency, and openness was also cited in focus group discussion in the village of Ntonya. A participant claims:

“SRWB did not consult us on tariff increases; in 2003 we were disconnected after alleged non-payment when households did not receive a water bill for four months. After we were disconnected we negotiated the payment of outstanding tariffs and we were re-connected.”

They also felt that there is no transparency in the water board since they are billed even if no water was coming out of the taps. Details of water rationing were also not communicated to the Ntonya community (Focus Group Discussion notes taken on 13 August 2012). Community participation was very strong during the construction phase of the Mpira Balaka water scheme.

“During the construction phase, members of the community provided building material such as bricks and cement that was used to construct various water points, including boreholes. Government disseminated information regarding the project, but when the scheme was managed by SRWB as part of the implementation of

IWRM, participation became tokenistic and eventually there was no participation at all.”

It is only the households who are part of the Mpira Water Authority schemes which are engaged through WUAs, the community water point committee and borehole committees. IWRM institutional arrangements do not promote participation, but inhibited the popular participation of 1987 when the scheme was at a conceptual and construction phase. In community water points, constructed and managed by World Vision, communities are involved throughout the project cycle in planning, implementation, monitoring, and evaluation of the project. An NGO official recalls: “World Vision entered into agreement with respective communities to raise K15000 maintenance and operation fund prior to the construction of a borehole that is estimated to cost about K1-2 Million.”

This was meant to ensure sustainability, but the results show that most schemes are not sustainable; the Mpira Dam is not enough to cater for all water supply needs which is why the Southern Regional Water Board and Balaka Hospital are requesting permission to divert additional water from the Shire River in the hope to end water rationing (Chigamba, Interview on 13 August 2012, Limbe Interview on 13 August 2012). These arguments support the views of Hoekstra (2006:18), Heller (2007:3), UNESCO (2006), Spash (1999:432), and Pearce (2002:61), who argue that water and sanitation governance must serve future as well as present users of water and sanitation services.

In the eyes of the participants in this study the roles in executive and legislative processes are not clear and result in institutions failing to explain and take responsibility for what they do. There are no boundaries to the functions of the Southern Regional Water Board and Mpira Water Authority regarding the provision of water supply and sanitation services. In many villages there are no hydrological boundaries or scope of practice between these two institutions. For instance the Mponda Primary School in Balaka is served by both institutions. During the era of water rationing the school used a communal standpipe established by the Mpira Water Authority. The situation is similar in the other

schools in the Mponda Zone, namely Kapalamula Primary, Sasola Primary, Zambimba Secondary, St Tlasys, Ostia, Matola, Khwisa, Kabango, Toleza, Ncheza, St Louis Secondary, the Bakhita and Praisys private schools, Secot Primary, Kink Range Private Secondary School, and Sir Green Johns Primary. The government is not responsible for paying school water bills regardless of whether they are public or private. They all need to use school fees to pay for their water bills, and are not subsidised, despite the fact that primary education and access to water are regarded as human rights in Malawi. Most schools in the Mponda Zone pay about K1500 water bills per month to the SRWB and about K50 for the use of communal standpipes in times of water rationing or when there are disconnections for non-payment (Interview with the principal and vice principal of Mponda Primary School on 11 August 2012).

There is also a lack of policy coherence, effectiveness and efficiency in water and sanitation governance. In theory many government institutions are responsible for various elements of water and sanitation policy, but in practice the Ministry of Irrigation and Water Development, the water boards, and Water Resources Board remain the main actors. School sanitation is implemented by the Ministry of Health, together with NGOs. The policies on water and sanitation are not in line with achieving the millennium development goals on education (Nindi, Interview, on 12 August 2012). IWRM advocates for the management of water at the lowest possible level, but none of the three districts in which the study was conducted has any capacity to manage water resources or even reticulate water to its citizens; it is a responsibility which both the Mpira Water Authority and the Southern Regional Water Board compete over. There is no evidence of cooperative governance at the local level as envisaged in the water and sanitation draft policies of 2007. The pricing structure of the Southern Regional Water Board is based on full marginal cost, and disconnections are used as a tool to enforce water user efficiency in the neo-classical sense. Charging schools an average of K1500 per month and disconnecting them if they are unable to cover their water bills is a failure to balance economic efficiency with political efficiency (Klein, 1999:470, Weber, 2001:54).

Results show that allocations of water and technology used in sanitation is not equitable. The fact that hospitals are provided with low pressure when they require high pressure in theatres and intensive care units undermines the right to health. All schools, regardless of whether they are in rural areas, use unimproved pit latrines. The Mponda Primary school with 2 761 learners received 19 pit latrines (eight for girls and eight for boys, two for female teachers and one for male teachers). This inadequate number of latrines result in long toilet queues during intervals, yet the school is situated in Balaka town which is served with flush toilets connected to a sewer. The school is in the same vicinity as the Catholic Church which is also connected to a sewer and uses flush toilets (Interview with Mponda Primary School Staff on 11 August 2012).

The water rationing affects the school since pupils spend long hours waiting for water in the communal standpipe in very long queues, instead of learning (Household Interviews, 13 August 2012). There are no water tankers to assist schools during the water rationing season. Even households in the city centre and in small towns use pit latrines. There is no level of service or standards that defines adequate sanitation. Amidst this scarcity of water, rich people who live in estates enjoy water which they abstract and divert from rivers. In most estates there is no water-rationing as neither the water boards nor the water authority serve water in these areas. In short, whilst there is scarcity for poor households in rural and peri-urban areas, there is abundance in estates and affluent areas. This constitutes class discrimination and lack of equity (UNESCO, 2003, Hoekstra, 2006:18, Ghandhi and Namboordini, 2009:15, Livingston, 2005:26, Klein, 1999:474, Heller, 2007:3, UNESCO, 2006, Spash, 1999:423).

Results show that there are no agreed upon property rights that advocated limitation of access, use, and ownership of water and sanitation. There is no discrimination based on race, colour, gender, and disability when it comes to access, but there are class connotations. Access to water and type of toilet facility depends on whether one can afford to purchase it. Failure to pay for water connected by the Southern Regional Water Board results in disconnections and some water committees restrict access to users that are unable to pay 'Inkosi yamaKhosi', a Ngoni word used for money in Malawi.

Discrimination may not be based on race or colour, but access to capital and affordability of water restricts poor households who reside in rural areas and lack money to pay water bills. Full cost recovery violates the fundamental right of the poor to access water and sanitation which is unethical since the majority of the poor would remain excluded if the Southern Regional Water Board was the only provider of water and sanitation services in Ntcheu, Balaka, and Mangochi (Household Interviews on 13-14 August 2012) This view is supported by Rogers, (2002:4), Fiani (2004:1003) Heller (2007:3), UNESCO (2006) and Spash (1999:432).

6.10.4 Institutional mechanisms

The Water Resources Act of 1969, the Water Works Act of 1995, the Water Policy (Draft) of 2008, and the Sanitation Policy (Draft) of 2008 in Malawi outlines institutional mechanisms, organisations, institutions, formal rules, informal constraints, informal norms, and enforcement characteristics that govern water (Mabira Interview, 2012). The formal rules that govern the water sector is found in legislations such as the Draft Amendment Water Resources Act of 2012 and IWRM policies that advocate a regulatory role for the Ministry of Irrigation and Water Development whilst the Mpira Water Authority, the Southern Regional Water Board and other commercialised state water utilities provide service (Mkandawire, 2011). Results show that the implementation of IWRM is facing difficulties because the MIWD is forced to intervene when local authorities in Ntcheu, Mangochi, and Balaka are unable to provide water and sanitation. The Mpira Water Authority is supposed to be a local regulator to the Southern Regional Water Board and district assemblies and focus on the sale of bulk water to water boards and assemblies. Market failures of the commercialised water boards however result in the Mpira Water Authority supplying water directly to hospitals, households, schools, and even towns (Mabira Interview, 2012).

These findings support the views of Pearce (2002:63) that IWRM philosophy which is based on neo-classical, revisionist and market-friendly theories, is flawed when it comes to institutional mechanisms through which water and sanitation projects are governed. The current institutional model is enforcing the allocation of water through market

mechanisms which means that those who can afford to pay about K4000 per month will have a connection to the Southern Regional Water Board while those that are unable to pay will either join the queue in community stand pipes managed by borehole committees on behalf of the Mpira Water Authority, or get water from unprotected rivers and shallow wells. According to Williamson (1995:189) the revisionists view market failures as pervasive and a justification for governments to lead markets in critical ways and this is the role played by the Southern Regional Water Board in the commercialisation of water access.

The Southern Regional Water Board uses price mechanisms and not institutions such as water user associations, borehole committees, subsidies, or indigent policies to increase sustainable access by the poor to water and sanitation services. If households in Ntonya Village can make a choice between a subsidised K50 communal standpipe and a K4000 Southern Regional Water Board connection, it is clear they will choose the former (Focus Group Discussion at Ntonya Village on 12 August 2012).

The rejection of market mechanisms and the pricing approach adopted by the Southern Regional Water Board have resulted in public hospitals such as the Balaka, Ntcheu and Mangochi District Hospitals choosing to get access to water through the Mpira Water Authority that puts more emphasis on getting the institutions and institutional mechanisms right. The view is supported by North (1993:5), Richter, (2005:1), Ghandhi et al (2007:5), and Klein (1999:468), namely that governance structures are a polarisation between market and hierarchy and determining the right price for water hardly solves the problem since the major problem lies in invoking the price and cost recovery.

6.10.5 Property rights

In Malawi, abstraction rights are allocated to both government institutions and the private sector. These rights are allocated together with either private or public property rights. Farmers in large estates abstract water from rivers, lakes, and aquifers and store them in irrigation dams. They pay abstraction licenses to the Water Resources Board or to a local office such as the Mpira Water Authority. Non-governmental organisations such as

World Vision, Go Malawi, Water Aid, Concerned International, and the Presbyterian Church also apply for abstraction rights in the many water points which they manage in their respective jurisdictions (World Vision Interview, 2012). Once they get an abstraction license, it becomes a private property right. This private property right mechanism is in line with the views of Coase and North (1992), North (1993), and Quiggin (2000:17), that private property rights are exclusive (in the sense that property rights which are ownership title and use rights in the hands of one individual exclude that these rights can be claimed by another individual).

The Malawi government has no jurisdiction over water points, irrigation, and multi-purpose dams constructed by the private sector and NGOs. Within the private property rights discourse, there are water boards supposed to function as state institutions and their property rights are supposed to be public, but their commercial nature brings them closer to private property rights. In the dispute between the Balaka District Hospital and the Southern Regional Water Board, the Ministry of Irrigation and Water Development was unable to intervene to correct the market distortions that resulted in low water pressure in various hospital wards due to their culture of non-payment. The only option for the MIWD was to remove Balaka District Hospital from the commercialised private property water allocation of the SRWB to a public property allocation of the Mpira Water Authority.

Public authorities such as the Mpira Water Authority, the Ministry of Agriculture, the Ministry of Health, and Ministries Responsible for Natural Resources such as Mines, Forestry, Fisheries, Lands, Environment, Parks, and Wildlife, are also responsible for the abstraction of water. They are also subject to stringent application conditions for licenses. Once the Ministry of Irrigation and Water Development approves licenses, the extraction of water which is a public property right can commence. It is still difficult to know the exact amount of water that is abstracted in various rivers, lakes, and aquifers; the government is supposed to know how much is abstracted per day by at least the various state institutions. In 2012, Blantyre was experiencing water shortages despite being located next to lakes and the Blantyre Water Board claimed that the shortages were due to

a lack of electricity in various pump stations. In the public property dispensation, water boards that operate as commercial entities have their own by-laws in accordance with Water Works Act of 1995 (Chunga, Interview, 10 August 2012).

In the public property rights discourse, there are WUAs that are influential in water allocation and the granting of abstraction rights. They participate in approving abstraction licenses in river or catchment systems and ensure that there is due consideration for down-stream users in allocating such rights. In Zomba, for instance, WUAs play an active role in their local IWRM platform in the rehabilitation of the Mulunguzi Dam. It is through the active participation of WUAs that the government currently provides free mosquito nets to all pregnant women in areas such as Mangochi and Zomba. WUAs working in the structures of Mpira Water Authority are ensuring that public property rights are protected (Chunga, Interview, 10 August 2012).

The public property right in the water sector supports the views of van den Bergh (2007:530), Quiggin (2000:19), Pearce (2002:59), and Kuks (2004:52) that common property occurs where rights reside jointly in the same group of actors who own undivided shares of the property. In this case WUAs, the Ministry of Irrigation and Water Development, and other state institutions are allocated abstraction rights within the parameters of public property rights. The role played by WUAs confirms the views of Gandhi et al (2007:6), Quiggin (2000:19), and Bromley (1978:53), that crafting institutions to manage water and sanitation governance is challenging and requires skill in understanding how the rules, property rights associated with physical, economic, and cultural environments, and appropriate institutions can promote maximum benefit for the beneficiaries. Beneficiaries of the Mpira Balaka Water Scheme work through WUAs to influence water allocations thus ensuring that it is agreed upon at the lowest level possible. Issues of water quality that are normally raised by water professionals are openly discussed in WUAs and actions are undertaken to enhance the good quality of water resources and the rehabilitation of rivers, lakes; and aquifers; the process is driven by beneficiaries (Mabira Interview, 14 August 2012 and Chunga Interview, 10 August 2012).

6.10.6 Public and private provision

Results show that within the Balaka, Ntcheu, and Mangochi districts, there is both private and public provision of water and sanitation services. The two state providers of water and sanitation services in the above three districts are the Mpira Water Authority that sells bulk water to the Southern Regional Water Board which in turn reticulates it in urban and peri-urban areas. The Mpira Water Authority is responsible for selling bulk water to water boards and also reticulates water in rural areas within the three districts. The environmental health department operating in Balaka, Ntcheu, and the Mangochi district hospitals is spearheading health and hygiene promotion in schools, public centres, and communities. The various initiatives of the Department of Health which includes declaring certain areas “open defecation-free”, distribution of chlorine to households, and prevention of water borne diseases, are supported by a number of water and sanitation NGOs that operate in the three districts (Nindi interview on 13 August 2012).

According to Dumisani Mfipha of the Malawi Red Cross, building pit latrines in schools produce difficulties associated with transaction costs since schools are expected to provide their own bricks and cement. In this arrangement, the provision of school sanitation is a private matter. Schools that are unable to provide bricks and cement have to wait for a longer time before NGOs are willing to assist them. Even though NGOs provide training in health and hygiene promotion, the continuation of this project depends on the availability of bricks and cement and other transaction-specific investments. Colex Champenduka, also from Malawi Red Cross, highlighted the lack of demand for sanitation facilities. If the prices of bricks and cement go up, a lower number of facilities will be demanded. Bernard Chiwalo, a beneficiary of toilet facilities constructed through Red Cross financial support confirmed that households and school communities do not have money to purchase bricks and cement because of the depreciation of the Malawi kwacha and a general lack of foreign currency (Malawi Broadcasting Corporation 10 August News Bulletin).

Households in estates and affluent areas build septic tanks and abstract water from rivers, aquifers, and lakes. In this private arrangement of water and sanitation there is a lack of balance between public and private provision. Commercial agriculture and other industrial users do not pay per cubic metre of water abstracted as they should, since it is difficult to charge for privately abstracted water. They only pay for licenses when they are issued and when they are renewed. The Ministry of Irrigation and Water Development does not have the capacity to install water meters that can be used to monitor the amount of water diverted for private and commercial use by commercial agriculture and industries. If the capacity to collect revenue from private and commercial users of water can be developed, poor households could be subsidised with bricks, and cement.

This institutional dilemma highlights the role of government in shaping the institutional environments of business and commons, as well as its administrative capacity to collect revenue from businesses that abstract water for commercial use (Richter, 2003:10). This is where Williamson's transaction cost economies differ from North's theories regarding the object of research: private goods in the case of transaction cost economy (TCE) and public goods in the case of North's theory. The poor pay for the construction of pit latrines and boreholes whereas the abstraction of water for commercial purposes remains a free service in Malawi (Chunga, Interview on 10 August 2012). The need for a basic social structure, or rules of the game on how the poor households can be cross-subsidised by the private sector that abstract water which is a public good and maximise profits without incurring any transactional costs is, relevant in Malawi (Richter, 2003:16).

6.10.7 Decentralisation and centralisation

Results show that since the promulgation of the Decentralisation and Local Government Act of 1998, district assemblies have increasingly been expected to drive water and sanitation provision. District Assemblies are expected to assist in the preservation of the environment and natural resources. Planning of water supply and sanitation starts at the village action plan (VAP) level, and the plan crafted with the assistance of extension officers, is submitted to the area development committee (ADC) which in turn forwards it

to the district coordination team (DCT). The district coordination team is the sub-committee of the district executive committee. The former comprises district heads from the Ministries of Water Development, Health and Population, Women, Youth and Community Services, Natural Resources, and NGOs. The most senior official in the water sector at the district level is the district water officer Aaron Mabira, responsible for the Balaka, Ntcheu, and Mangochi district assemblies at the time of writing.

He is responsible for community-based planning and training, supervision of works, and the monitoring of water supply projects. The district water officer, works together with the district development committee which comprises an MP, traditional authorities, representatives of business, and WUAs. This is the executive committee of the district assembly which allocates resources from the district development fund based on projects suggested and prioritised in the Village Action Plan (Ferguson and Mulwafu, 2004:1, Weller, 2005:12, Mkandawire, et al, 2011:10). In the three districts combined there are 400 sanitation schemes. The Mpira Water Authority constructs toilet slabs and the communities are responsible for digging pits, and mixing of the precast; the construction of the top structure is provided by the government. The WUAs are responsible for health and hygiene promotion and verifying the demand for sanitation facilities within various traditional authorities. They are also responsible for the election of catchment, water point, and area committees. They participate in the board of trustees of the Mpira Water Authority and are elected by various communities to represent their interests in the general assembly of the authority (Mabira, Interview held on 14 August 2012).

Political patronage dominates the distribution of local development funds. On 11 August 2012, the then Deputy Minister of Finance, Ralph Jooma, used the event in which houses for principals were handed over at Mangochi to promote the then ruling People's Party:

“The event is making the People's Party of Joyce Banda popular, even members that defected from DPP constituency committees are welcome to join PP. PP is the future of Malawi and we are using this opportunity to strengthen our structures. The houses we are distributing today demonstrate our commitment as PP government to ensure

that our school children learn in the atmosphere that is conducive to learning and we are increasing access to water and sanitation in our schools.” (Malawi Broadcasting Corporation News Bulletin, 11 August 2012).

The houses that Ralph Juma was referring to was a refurbished residence of the principal of the Mangochi Primary School and the event coincided with the launch of constituency committees at Mangochi. Participants were wearing the orange colours of the People’s Party which defected from the DPP upon the death of the former president Bingu wa Mutharika. It is strange that the Deputy Minister of Finance was delegated to open one house and one borehole in the presence of over 5,000 members of the People’s Party. The state function was in fact a People’s Party rally rather than a government function. Ralph Juma simply used the function and the resources of the local development fund for party political purposes. In a similar function Sam Kalanda, the Mangochi District Commissioner, announced that the training of natural resource committees responsible for Lake Malawi is sponsored by the African Development Bank. He was also wearing a People’s Party uniform when he made this announcement. Members of Parliament dominate the allocation of local development funds and use political patronage to advance party political interests (Malawi Broadcasting Corporation News Bulletin, 11 August 2012).

In another function which was supposed to be hosted by the local development committee, the then Deputy Minister of Environment and Climate Change, Ebrahim Matola, announced that the UK government was assisting the Meteorological Department of Malawi with a supply of digital weather recording instruments. The Ministry of Agriculture also used a similar event to announce farm diversification programmes undertaken by the agricultural district commissioners of Ntcheu, Mangochi, and Balaka to adapt to climate change. The programme promoted climate resilient crops that do not consume much water cultivated through crop rotation. Dr Stanley Khaila from the Bunda Agricultural College was working with the Ministry of Irrigation and Agriculture in promoting a farm diversification programme. Normally, such announcements are made in

press conferences convened by the government and not in party rallies (MBC, News Bulletin, 11 August 2012).

Results further show that village health and water committees lack the capacity to monitor water quality on a monthly basis, and that the decentralisation of administrative functions is not accompanied by fiscal decentralisation. District assemblies have limited control over boreholes and other schemes. Boreholes are constructed by NGOs such as World Vision, Concerned Universal, and Go Malawi. The district assemblies in which such schemes are allocated have no control since it is the responsibility of the Water Resources Board to grant abstraction rights to NGOs; district assemblies are not involved in this arrangement. Other boreholes are constructed, operated, and maintained by the Southern Regional Water Board and the Mpira Water Authority (Mabira Interview, 14 August 2012, Chigamba Interview, 13th of August 2012).

The findings are contrary to the views of Indranil (2009), Batterbury and Fernando (2006:1851), Selee and Tulchin (2004:297), and Wunsch (2001), that decentralisation takes care of the needs and preferences of communities as powers and responsibilities are devolved to lower levels. There is no evidence that decentralisation increases accountability of the government in the delivery of services. Instead, communities that were involved in borehole committees from as early as 1987 when the Mpira Balaka water scheme was conceived, indicated that there was strong public participation when the Ministry of Irrigation and Water Development was still involved, compared to the current period during which the Southern Regional Water Board simply cuts off water for non-payment without notification. Due to the failure of the water board to send water bills on time, communities are charged for water even when cut-offs have lasted for more than three months (Focus Group Discussion, 13th of August 2012).

There is also no evidence in the field that decentralisation promotes efficiency, enhancement of public services, and more open and accountable forms of government as propounded by Batterbury and Fernando (2006:1851), Selee and Tulchin, 2004:297 and The Sustainable Livelihoods in Southern Africa (SLSA) (2008:3). Failure to circulate

water bills on time by the Southern Regional Water Board, disconnection of water without verification of non-payment, failure to consult households about water rationing, and the imposition of low water pressure on district hospitals, are some of the reasons households, government officials, and the private sector believe that decentralisation in Malawi has brought about inefficiency, lack of openness or enhancement of public services, and a lack of accountability.

The fact that Aaron Mabira is the district water development officer responsible for Balaka, Ntcheu, and Mangochi, the project engineer for Mpira Balaka Water Scheme, and also the CEO of the Mpira Water Scheme clearly shows the weaknesses of decentralisation. How can one employee be given so many responsibilities? How can one employee manage three vast districts and still be in charge of the secretariat of the Mpira Water Authority? Results show that there is a lack of sufficient technical human resources to perform budgeting functions. There is also evidence of confusing roles among the locally elected representatives and their national counterparts, as well as the recapturing of authority and resources allocated to local government as postulated by Wunsch (2001:280) and SLSA (2008:8). In Malawi the bylaws of water boards are ignored by the water resources authority and the Ministry of Irrigation and Water Development. When granting licenses for the construction of boreholes water boards are not consulted and the allocation of water that is supposed to be agreed upon at a local level in a multi-stakeholder process, is not always considered.

In 2012, the Balaka District Hospital applied for the abstraction of water through a pump station and the usage of the Mpira Water Authority's Water Treatment Plant. The negotiations were at an advanced stage but the Southern Regional Water Board was never consulted. The Mpira Water Authority which acts as the local office of the water resources board was ready to take over the functions that are normally performed by the water boards. There were households in rural and urban areas that were part of both schemes. During water rationing, they continued to access water through the Mpira Water Authority's communal taps. The operation of both schemes in one area is not just a duplication of efforts, but is rendering decentralisation useless in Malawi.

6.10.8 The role of market mechanisms

Regarding consumption, Veblen's theory of the leisure class is confirmed in the findings whereby the Mpira Dam is situated in rural areas of Ntcheu but benefits the urban households of Liwonde, Ntcheu, Mangochi and Balaka. Households that enjoy flush toilets and connection to sewers and water are mainly located in urban areas and farm estates. The households who were responsible for the construction of the dam and production of water do not benefit, but only get access to water through communal standpipes (Hamilton, 1989:1100-1).

Chapman's (1973:1415) observation that consumption or quasi-consumption is localised in metropolitan areas and effluents are concentrated to the point of swamping the assimilative capacity of local environments holds true in Balaka Town. Dilapidated sewers are visible in the railway station and effluents are discharged into rivers and water points. In 2012, a perception was created by the Southern Regional Water Board about the scarcity of water in the water pipes from the Mpira Dam to Liwonde and used to justify rationing to various households. The fact that households directly connected to the Mpira Water Authority are not subjected to rationing clearly supports the views of Miller (2003:58), who rejects the neo-classical theory of production. In contrast, many institutional economists hold the view that an increase in scarcity values only serves private interests and is not in the interests of society; public interest is to increase production and not scarcity.

There is evidence that the water sector in Malawi is deregulated. The government has no record of water points, boreholes, and pump stations are controlled by the NGOs and private sector. Irrigation dams controlled by commercial agriculture and NGOs are not known to government (Interview with Chunga on 10 August 2012). Even during the era of UDF from 1994-2008, various attempts were made to regulate water resource management and to harmonise existing water abstraction rights. To date, there are an estimated number of 700 dams in Malawi which is further endowed with water resources in the form of lakes, rivers, dams and aquifers. Water rationing imposed using scarcity is

thus a reflection of distorted market size, diseconomies of scale, and an increase of market share and sales which characterises the use of the theory of production in the neo-classical sense (Miller, 2003:59, Klein, 1999:463).

Within the parameters of the theory of distribution, results show that when allocating resources such as access to water and sanitation, various water institutions in Malawi use orthodox economics to justify existing income distributions on both efficiency and equity grounds. To illustrate this theory of distribution, the Mponda Primary School is well placed since it is in the same area as the Catholic Church in Balaka. Mponda is connected to the Southern Regional Water Board, as well as having access to a communal water point. When it comes to sanitation, however the Catholic Church is connected to a sewer and the school uses pit latrines. The Malawi government encourages free education in primary schools but does not subsidise access to water and sanitation in schools. The Southern Regional Water Board ignored equitable distribution when allocating flush toilets to the Catholic Church and not the school in the same area. The school board used an income efficiency criterion, which stipulates that marginal revenue produced is equal to the marginal cost of employment, to justify denying the school access to flush toilets (Interview with Mponda Primary staff on 12 August 2012, for theory refer to Hamilton, 1987:250, Miller, 2003:60).

Access to water and sanitation facilities in Malawi is determined by social and class ranking. In this regard social rankings and not marginal productivity are the basis of income differentials and therefore give access to various levels of water and sanitation standards. Linked to this view are high poverty levels in rural areas, low levels of education, poor shelter, and low consumption, which are used to justify pit latrines even in areas where sewer lines are available. Boundaries between the market centres of Balaka, Mangochi, and Ntcheu are artificial and invisible, but social ranking and standing determines the type of sanitation and water facilities provided. Those who fall into the category of rural poor are subjected to communal stand pipes or boreholes and pit latrines, and those who are classified as high income earners are provided with house connections to water and flush toilets through water board sewers or septic tanks (Focus

group discussion at Ntonya Village on 14 August 2014, see Hamilton, 1971:73 for theoretical arguments).

6.10.9 New Institutional Economics

6.10.9.1 Transaction costs and information costs

Users of water resources in Malawi lack access, the effort, time, and funds to obtain the necessary information to make an exchange, negotiate the exchange, and enforce the exchange. In all the focus group discussions there was not a single water and sanitation committee that had seen the tariff structure of the Southern Regional Water Board. They were equally unaware as to when the water bills are supposed to be delivered to households or borehole and water point committees. Lack of such information results in difficulty for WUAs as individual economic agents to operate within a given institutional structure such as the Mpira Water Authority. In a local IWRM platform it is important for stakeholders to agree on water allocations at the local level wherever possible.

The main weakness of the catchment committees is that they are operating in what North (1993:1) refers to as a world of instrumental rationality in which institutions are unnecessary, and ideas and ideologies do not matter, but efficient markets both economic and political characterise economies. Most members of the WUAs who participated in the study acknowledged that incomplete information from water institutions hinders their capacity to process such information (Focus Group Discussion held on 14 August 2012). One member of the WUAs from Ntcheu commented as follows:

“We are expected to monitor water quality within the catchment areas and to contribute to the tariff structure of both Mpira and Southern Regional Water Board, but the information that government provides is so scanty that we are unable to effectively participate.”

The reasons for the lack of adequate information provided to stakeholders is associated with corporate secrets that the Southern Regional Water Board use to gain competitive

advantage, and with the fact that information is costly and asymmetrically held by parties to the exchange (Nabli and Nugent, 1989:1335, North, 1993:2, Richter, 2003:10). Stakeholder engagement does not yet form part of the corporate culture of the Southern Regional Water Board. The Mpira Water Authority established WUAs and installed stakeholders within the board of trustees: traditional authorities, government departments, district and local assemblies. Still, the board of trustees of the Southern Regional Water Board is not as inclusive as Mpira. Communication regarding water rationing in Balaka, Ntcheu, and Mangochi was not forthcoming because the Southern Regional Water Board believes in cost minimisation. In addition there are no formal rules as advocated by North (1993:3) and Richter (2003:8), to serve those with bargaining power in the creation of new rules. IWRM represents new rules in water governance in Malawi and therefore calls for shifts in transaction and information costs to benefit all stakeholders.

6.10.9.2 Institutional transaction costs

When it adopted IWRM, the government of Malawi did not factor in the role of the real costs associated with non-economic and non- market aspects. Community service centres and related community service agents are not employed at the level of district and local assemblies to involve communities in tariff reforms. The institutional transaction cost framework used did not include endogenous and exogenous institutional features pertinent to water and sanitation governance as advocated by North (1990), Ostrom (1990), Saleth and Dinar (2004).

The Ministry of Irrigation and Water Development as the sector leader, is supposed to facilitate local stakeholders such as the district assemblies, the Southern Regional Water Board, the Water Resources Board, the Mpira Water Authority, the Ministry of Agriculture, the Ministry of Health and the Ministry of Local Government. Before internal water stakeholders can engage with external stakeholders such as village committees, water user associations, NGOs, and other stakeholders, it is imperative that there is a coherent approach. The tensions between the Southern Regional Water Board and the Mpira Water Authority regarding the causes of water rationing in Balaka, Ntcheu, and Mangochi, and the lack of participation by the Ministry of Agriculture in local IWRM platforms, are indications of a lack of synergy and a return to bounded

instrumental rationality and reduction-mechanistic approaches to water governance that many scholars warn against (Soderbaum, 1990:485, North, 1993:1, Klein, 1999:457, Richter, 2005:2).

When the Southern Regional Water Board disconnects households for non-payment and imposes water rationing without consultation, the assumption is that the invisible hand of the Mpira Water Authority will take over and provide water to the households at a communal water point at a rate of K50, which is considerably cheaper than the K4000 charged by the water boards.

The endogenous factors related to the water and sanitation sector are, in the process, ignored: water scarcity, water conflicts, financial and physical deterioration, service levels, and water and sanitation related ecological effects such as water logging and salinity. The appearance and smell of water from the Mpira Balaka Dam has been affected by algae blooms. This contamination of water resources is caused by treated industrial effluents that contain heavy metals such as zinc, copper, and mercury. These metals used in paints, plumbing, and pesticides, accumulate in food chains and are persistent in the ecosystem. There is no evidence of water scarcity and water conflicts, but there is deterioration of quality and lack of service level standards. Water logging and salinity is common in water drawn untreated from boreholes which is why the Balaka District Hospital has asked Water Missions to assist them with treatment facilities after they stopped taking water from Southern Regional Water Board (Limbe Interview on 13 August 2012).

6.10.9.3 Institutional evolution

IWRM institutions have evolved as part of the requirements for the funding of water infrastructures. When the Mpira Water Scheme was established in 1987, IWRM was not a requirement and the Southern Regional Water Board, the Mpira Water Authority, WUAs, catchment committees, and other stakeholders did not exist. Policies such as the Water and Sanitation policy of 2007 were also not part of the arrangement and the Water Resources Act of 1969 was the only legal framework that governed water resources in

Malawi. The scheme started as a water scheme only and sanitation only came into the picture later on.

Instead of increasing the efficiency of existing institutions, the Southern Regional Water Board evolved to increase the well-being of powerful groups that exploit other groups. Water provision remains inefficient and costly. The rules of the game that guides institutional arrangements in Malawi remain a grey area since there are overlaps in the roles of both the Mpira Water Authority and Southern Regional Water Board. The Mpira Water Authority is supposed to be selling bulk water to water boards, but is involved in many areas as a service provider competing with water boards. Even district hospitals and commercial agriculture are emerging as water service providers. The local authorities that were designed to take over water reticulation responsibilities are still lagging behind.

6.10.9.4 Constitutional choice

The constitution of Malawi elevates the president to the custodian of water resources. Both water and sanitation policies advocate the availability of water and sanitation services in a sustainable manner. The state is supposed to provide subsidies to schools and poor segments of the population. There are no indigent policies that promote access to water and sanitation at a minimum level to meet social and economic needs and advance fundamental human rights to water and sanitation. According to Fiani (2004:1014) the state specifies and elaborates on, and is ultimately responsible for the efficiency of the property rights structures.

Private property rights dominate access to water and sanitation in Malawi. If a household does not have access to resources they resort to unprotected water sources, or purchase access to a community stand pipe or house connection. There is no minimum amount of water that the state provides for free. The Mpira Water Authority provides water at a rate of K50 per month per household regardless of the size of the household. This is not stated as a subsidy in any state document and there is no constitutional obligation for the state to continue to do so, but it is recognised as some form of subsidy compared to the rate of K4000 charged by the Southern Regional Water Board per month. This unofficial form of

subsidy supports the view of North (1981:18) that the state provides economies of scale and services that could be expensive for private agents to provide and protect themselves.

6.10.9.5 Law and economics of contracts

In Malawi there is a need to set up institutional arrangements or governance frameworks to protect transacting parties from the various hazards associated with exchange. If residents do not receive a water bill for three months and they are disconnected without prior notification, there must be an ombudsman they can complain to. If they are subjected to water rationing without any notification there should be some form of recourse. Richter (2003:14) argues that a complete contract specifies a course of action, a decision, or terms of trade contingent on every possible future state of affairs. This course of action is not reflected in contracts citizens enter into with their respective water boards. In the absence of a customer services charter and agreed upon service level standards, households have no recourse if water boards fail to deliver services. The current contractual agreements between citizens and service providers are, according to Klein (1999:466-467) and Fiani (2004:1008), implicit agreements that, while unstated, are assumed to be understood by all sides.

There is no match between governance structures and the particular characteristics of transactions. The Mpira water scheme was designed to provide free access to water to rural households but the current institutional arrangement and market structure advocating full cost pricing is not what households in Balaka, Ntcheu, and Mangochi are used to or prepared to put up with. The arrangement that best reflects Malawian society is the communal standpipe or public borehole at a rate of K50 per household per month which represents a slight difference from the free water they enjoyed from 1987 when the scheme was completed. This informal institutional arrangement whereby households are not provided with a water bill, but members of the community elected amongst water users collect K50 per household or K15000 per group of households if they intend to construct a borehole with the assistance of an NGO such as World Vision, is very common in Malawi (Focus group Discussion, 13 August 2012).

This contractual arrangement is in line with Williamson's transaction cost econometric (TCE) theory of contracts where legal enforcement and self-enforcement complement each other (Richter, 2003:20, Granovetter, 2003, Fiani, 2004:1004). Members of various committees are responsible for the enforcement of payment but this is difficult to implement. The borehole committee enforces payments amongst households; those who are unable to pay are not disconnected, reducing the payment incentive. Most borehole committees that participated in the study disobeyed the instructions of the SRWB to disconnect households that are unable to pay (Focus Group Discussion, 13 August 2012).

6.10.9.6 Theory of institutions

All three categories of the theory of institutions, namely evolutionary, market-based, and bargaining theories advocated by Saleth (2004), are visible in Malawi. Decentralisation and market-based theories are based on conditions put in place by donors. IWRM evolved from donors such as the African Development Bank and World Bank. One of the social conventions responsible for the evolution of IWRM in Malawi is the World Summit on Sustainable Development (2002) from which the resolution emerged that all UN member states must adopt IWRM plans by 2005. Malawi only adopted its IWRM plan in 2010 and implementation is still a big challenge. Full cost accounting used by the Southern Regional Water Board was reflected in the disconnection of 20 000 households for non-payment at the end of 2011 financial year in Mangochi, Balaka, and Ntcheu (Chigamba Interview on 13 August 2012). According to Mathews Chigamba, households receive bargain prices when they construct new water infrastructures using NGOs such as World Vision. The initial contribution is negotiated with households and upon raising enough money construction commences.

6.10.10 Environmental economics

6.10.10.1 Eco efficiency and sustainability

The Mpira Dam was constructed for a population that is far smaller than the current populations of Balaka, Ntcheu, and Mangochi. The government of Malawi is grappling with sustainable development, as advocated by scholars such as Schaltegger and

Synnesvedt (2002:343). Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The biggest sustainability challenge in Malawi is the lack of operation and maintenance budgets in many schemes. The fact that the number of people who have access to water has declined by 32% since 2001 due to the breakdown of various systems, clearly indicates that sustainability remains a big challenge. In government boreholes there are no tariffs levied to households, but whenever there is a breakdown communities contribute towards the maintenance of the borehole through their committees. The borehole at Ntonya Village was constructed in 1988 and is still functioning to design capacity. Since there is no alternative source of drinking water, households collect funds if there is a breakdown in the facility. Since 1988 households have been saving K10 per household per month to meet operation and maintenance needs. There has been instances where government conducted repairs without community member contributions.

When households are looking for spare parts they are readily available in the Balaka market centre. After purchasing parts, the Mpira Authority is invited to assess the problem and recommend technical solutions. Engineers at the Mpira Water Authority provide advice regarding the purchasing of spare parts or conducting an overhaul of the water infrastructure if it is beyond repair. Unlike the Ntonya Village households, Community No. 8 and Community No. 26 do not have a bank account in which operation and maintenance funds can be kept. The borehole committee for No. 8 Borehole advised government to make seed money available for communities to sustain water and sanitation projects. Members of the committee have been volunteering since 1987 and suggested that an incentive in the form of stipends can contribute towards sustaining committee members who manage the public taps (Focus Group Discussion notes taken on 13 August 2012).

World Vision officers based in Balaka acknowledge that even though spare parts are available, they are expensive since they are imported from South Africa, and sometimes difficult to find. Most NGOs that operate water and sanitation projects help with the cleaning and maintenance of pipes, but do not provide plumbing which requires advanced

technical skills. In order to ensure that a project is sustainable, World Vision requires that each community raises an operation and maintenance fee of K15 000. Fund-raising prior to the construction of a borehole contributes to community ownership of the project. The K15 000 is kept in an account and used for operation and maintenance while World Vision contributes between K1 and K2 million towards the construction of infrastructures. Projects such as the Mpira Water Scheme contributes to the reduction of waterborne diseases, and projects established to complement the schemes have reduced cholera prevalence over the past three years (World Vision interview on 13 August 2012, Nindi Interview on 13 August 2012).

In Balaka, there are incidences of waste being dumped in water resources, and incidences of environmental degradation are very common. The Balaka district assembly does not collect waste from households. Similar situations were reported at Ntcheu and Mangochi. Such unsustainable practices arose as the result of inappropriate choices of marginal discount rates. Therefore sustainability became oriented to restoring water flows, ecological reserve and water quality in the case of dams and rivers. The Mudi River in Blantyre is heavily polluted with faecal bacteria counts as high as 20 000 faecal coliforms per 100 millimetres (Chunga Interview, 08 August 2012 and Nindi Interview 13 August 2012).

Through observation it was discovered that accumulated sludge from pit latrines and septic tanks has often not been removed, leading to overflow problems in sewerage systems that suffer from operational problems associated with vandalism. Water-related vector-borne diseases such as malaria, typhoid, cholera, and bilharzia have infected most people around the irrigation schemes in Malawi. It is difficult to spend an evening in Ntcheu, Mangochi, and Balaka without using a mosquito net. There are no civil society structures to engage government on issues of environmental degradation in Malawi. Within local authorities, there are no departments advocating Local Agenda 21, monitoring water quality, and promoting river health, and even the Ministry of Irrigation and Water Development has not developed agreed upon criteria for local authorities to account for environmental degradation.

Field visits to the treatment and purification plant at Mpira in 2008 and 2012, revealed that there was a lack of chlorine in the water purification process (Champiti, January 26, 2008 Interview, Mabira, 14 September 2012 Interview). The director responsible for water resource management at the Ministry of Irrigation and Water Development, Charles Champiti, downplayed the lack of chlorine as a normal problem in developing countries, and blamed local authorities for failure to perform duties that were devolved to them as a result of the Decentralisation Act of 1998. Exactly 10 years after the promulgation of the Decentralisation Act of 1998 and two years after the adoption of IWRM (2010), not a single local authority had established water and sanitation departments or environmental or catchment management departments. In the absence of such institutions, ecosystems are irreversibly lost to future generations. The findings also confirm the viewpoint advocated by Soderbaum (1990:484) and Pindyck (2007:49) that environmental problems are extended in time often across administrative boundaries and sectors. Environmental problems caused by a municipality that mismanages a waste water treatment plant could affect other municipalities, agriculture, the economy, industrial users, and domestic users and may not be confined to one sector; sustainable development is therefore critical.

The fact that the MIWD was hoping that local authorities would raise enough money to purchase the chlorine required for water purification and that district water and environmental officers who report to principal secretaries within their national ministries would drive environmental protection and prevent water degradation, illustrate the faults in the system. There is no agreement on equitable sharing of revenue between local authorities and national government for functions that are devolved. The Southern Regional Water Board is expected to treat water before it is distributed to households, but there is no cooperative governance arrangements agreed upon between water boards and the National Water Resources Board on how to deal with environmental degradation. Water boards are expected to monitor water quality within the water supply systems and promote catchment management and pollution control (Ng'ong'ola, 1999:11).

The Ministry of Irrigation and Water Development is also responsible for the regulation of water quality standards that need to be adhered to by water boards. The process of how this is done in terms of benchmarks and reporting to the legislature and holding water boards accountable, is not clear. The ministries in charge of natural resources are responsible for conservation, protection of catchment areas, protection and rehabilitation of river catchments, eradication of aquatic weeds, and coordinating all cross-cutting environmental activities required for water resources management and water services. The implementation of IWRM is still at an early stage in Malawi because promotion of health and hygiene education in water and sanitation services, and monitoring and providing guidance concerning the quality of drinking water, is the responsibility of the Ministry of Health and not Irrigation and Water Development. The Ministry of Health is also responsible for providing appropriate interventions to prevent the prevalence of water-related diseases and water demand management for public health institutions which is also a function of the Ministry of Environment (Chipofya, et al, 2010:265, Mkandawire et al, 2011:11). The roles of various national ministries are not clear and it is even worse when it comes to environmental degradation and over-consumption of water by one stakeholder at the expense of others.

6.10.10.2 Environmental performance

Studies show that the quality of water in Malawi is poor. The majority of households who participated in the study draw water from boreholes and consume untreated water. Only households who are part of projects managed by NGOs and the Ministry of Health (in particular environmental health offices in the Balaka, Mangochi, and Ntcheu District Hospitals) who benefit from doses of chlorine. Schaltegger and Synnestvedt (2002) postulate a link between economic performance and environmental performance and results show that economic growth and development is low in the areas in which the study was conducted and therefore environmental performance is also poor. In market centres such as Balaka, Ntcheu, and Mangochi one can expect general cleanliness and maintenance of public toilets and water points by the local assemblies. But in the public transport ranks there is no maintenance staff, no planted trees, and unkempt verges.

There are no parks and gardens in all three local assemblies responsible for the market centres. The public toilets that households use at a cost of K5 per person are not cleaned at all. People resort to visiting bread and breakfasts and motels to access clean public toilets in market centres. The argument put forward by Schaltegger and Synnesvedt (2002:340), Sagoff (2000:1426), Munasinghe (1993:127) and Pindyck (2007:46), that willingness to pay for environmentally friendly services depends on environmental and health regulations and stakeholder pressure to maintain acceptable quality standards, developed and enforced at country level, is equally true in Malawi. People who use public latrines in market centres are doing so because there are no other alternatives available. In 2012, there was water rationing in most of the areas serviced by the Southern Regional Water Board and a lack of water for over 4 weeks with effect from 10 July 2012. Water only flowed during the night and hospitality industries were unable to provide water to flush toilets; buckets were used to bath and flush toilets. Hand washing facilities are still available in most motels and public toilets and the use of buckets for hand washing and flushing toilets did not affect the occupancy rate in both these facilities.

There is no evidence of stakeholder pressure to maintain acceptable quality standards regarding river health, and spillage of sewage into water bodies such as groundwater, aquifers, and boreholes. There are no environmental action groups in Balaka, Ntcheu, and Mangochi putting pressure on government to adhere to acceptable water quality standards. The few NGOs that participated in the study are more involved in financially supporting water point construction, latrine construction, and health and hygiene promotion. They are equally not putting any pressure on either the Mpira Water Authority or the Southern Regional Water Board to deal with effluent discharges into river systems. The viewpoint articulated by Synnestvedt (2002:342) and Sederbaum (1990:484) that there are economic disincentives for corporate environmental protection which results in companies putting more focus on short-term profit maximisation, is clearly visible in Balaka, Ntcheu, and Mangochi. Both the Southern Regional Water Board and the Mpira Water Authority are not active in environmental protection; their main focus is selling water to households. The Mpira Water Authority is mainly

preoccupied with selling bulk water to the Southern Regional Water Board and reticulates directly to rural households within its jurisdiction. Even the operation and maintenance of the water infrastructure is not receiving attention as it is not contributing to profit maximisation.

No environmental cost accounting, investment appraisal, other environmental management systems, or ecological control systems are followed by the Southern Regional Water Board. There is no evidence in the jurisdiction of the Southern Regional Water Board of catchment protection, stream cleaning, and removal of alien plants and invader weeds as part of river health restoration. Even the Water Resources Board is confined to water licensing, and the catchment protection duties of the Mpira Water Authority are not performed due to lack of funds and the assumption that the Ministries Responsible for Natural Resources such as Mines, Forestry, Fisheries, Lands, Environment, Parks, and Wildlife will include the state of water resources in the state of natural resources report and act on the findings regarding environmental degradation (Chipofya, et al, 2010:264).

There is a lack of what Schaltegger and Synnesvedt (2002:345) and Soderbaum (1990:484) regard as optimum environmental performance which is achieved when a water and sanitation utility establishes ecological control measures. This should include ensuring that production processes are optimised to reduce costs through environmental tools which support the identification of eco-efficiency potentials and the successful implementation of eco-efficiency enhancing measures. There are no ecologically sound sanitation facilities that use less than six litres of water per flush or ecologically sound sanitation proposals in the Sanitation Policy of 2007. The latrines constructed in all 400 projects implemented by the Mpira Water Authority are mere pit latrines with ventilation and not constructed according to ecological sanitation principles.

6.10.10.3 Physical and economic scarcity

There are various views in Malawi regarding the scarcity of water. There is general consensus that Malawi is considered to be endowed with relatively rich natural water

resources in the form of rivers, lakes, and aquifers (Njalam'mano, 2007:4, FAO, 2007, Ng'ongo'la, 1999:9, Ferguson and Mulwafu, 2004:3, Chipofya, Kainja and Bota, 2010:261, Mkandawire, et al, 2011:1). Scarcity is therefore not linked to the production possibility curve traced by Massarutto (2007:2) in the neo-classical economic sense, nor to the total volume of water needed divided by country's total renewable water resources as outlined by Hoeksta (2006:20), Spash (1999:415) and Munasinghe (1993:126), but to economic scarcity.

There is no evidence of physical scarcity in Malawi. The country's total renewable water resources are estimated at 30 cubic kilometres per year. Ng'ongo'la (1999:9), Ferguson and Mulwafu, 2004:3) estimate renewable freshwater resources of about 3,000 cubic metres per capita per year, but distribution is irregular and varies according to class and economic standing. Physical scarcity in Malawi is linked to water availability constrained by hydrological factors, opportunity costs of water and sanitation, the costliness of water services, the construction of reticulation water pipes, the availability of waste water treatment plants, the availability and management of purification plants, sufficient water to flush toilets, and the availability of water storage facilities with sufficient quantities of bulk water that can be reticulated for domestic consumption.

Regarding the costs of water, it is clear that households served by the Southern Regional Water Board pay more for water than those served by the Mpira Water Authority. The water pipes used to reticulate water to households are old and require rehabilitation since the scheme came into operation in 1987. An under-resourced purification plant at Mpira Dam results in unpurified water being sent to households in some instances. Employees who manage the purification plants are not adequately qualified to perform their duties; for instance the Mpira Water Authority relies on Engineers Without Borders (EWB) for additional capacity to perform project management functions. Households in the areas in which the study is conducted have very few flush toilets which made it difficult to establish whether there is enough water to flush toilets or not. According to the National Statistical Office (2009:64) the number of households who have access to water in Ntcheu, Balaka, and Mangochi are estimated at 78%, 86%, and 91%, respectively. The

time taken to get to the nearest supply of drinking water is estimated at between 0-14 minutes for about 81% of Ntcheu households, 81% of Balaka households, and 92% of Mangochi households respectively.

The estimates of the NSO (2009:64) were confirmed in the field where similar results were established, but the NSO underestimated water rationing which results in longer distances and more than 60 minutes taken by households looking for water. In the Shire River system there are 62 dams which include the Mpira Dam. In the other 16 catchment areas in Malawi there are 687 dams. Generally there are adequate water storage facilities in Malawi; the challenge is capacity to increase water supply, purify and treat water due to lack of infrastructures, and to find the human resources to do so.

Saleth and Dinar (2004) and Pearce (2002:60) highlight economic scarcity which is also visible in Malawi. This refers to the set of institutional rules, property rights and shared cultures in any given historical context, appropriate regulatory systems, and institutional mechanisms. The institutional mechanisms in Malawi are the Ministry for Irrigation and Water Development responsible for water supply and sanitation in rural areas, and water boards responsible for market and urban centres. With the introduction of IWRM in 2010, the functions of the MIWD are now devolved to the Mpira Water Authority. The system works well in rural areas where households have access to water even if they are disconnected by the Southern Regional Water Board, but peri-urban and urban households have no access to water if they are disconnected. Rural communities who are only served through the Southern Regional Water Board lack access during water rationing and disconnections. It is not the lack of water as a physical resource that results in scarcity, but institutional mechanisms and rules that result in lack of water in households in the Ntonya village. Community No. 8, for example, is not experiencing scarcity.

6.10.10.4 Externalities

Poor quality of water resources is caused by agricultural activities such as the application of agrochemicals, and poor farming practices and land husbandry. The other cause is the

disposal of industrial and human waste, particularly in urban areas. In 2012, there was a sewage blockage next to Community No. 8 and the disposal of human waste was visible in the street. The observation by Mkandawire et al (2011:2) regarding pollution from agricultural activities and human waste is confirmed by findings in the Ntcheu Market Centre where public toilets are sometimes blocked for more than two weeks due to water rationing. Human waste was visible in different parts of the city and no authority accepts the responsibility for removing the waste. This is in line with views shared by many scholars (Stavins, 2004:1, Weber, 2001:53, Van den Bergh, 2007:529, Diets and van der Straaten, 1992:28) that government should take action to deal with externalities and come up with laws and penalties for visible diseconomies caused by the private sector.

There is evidence in Malawi that the government is not considering imposing taxes on emissions equal to the cost of the related damages at an efficient level of control as proposed by Pindyck (2007:53), Cropper and Oates (1992:680), Stavins (2004:1) and Pearce (2002:58). There is no evidence of companies paying pollution taxes. In the absence of taxes and levies, the government is subsidising the water treatment and purification system. Even private providers of treatment facilities are not subjected to additional taxes and levies associated with externalities and in particular effluents discharged in the river sources. Even the agricultural sector cited as the main source of externalities is immune to pollution taxation. Households who bear the brunt of pollution end up being the only ones paying for externalities. In the Coasian framework, both polluters and victims are supposed to pay for externalities, in the sense that it may make broader economic sense to allow an efficient producer to impose these costs on others. In Malawi, polluters are high income agents and victims low income agents as postulated by Coase (Weber, 2001:53, Cropper and Oates, 1992:680, Pearce 2002:61); in any case, there are no mechanisms to hold polluters accountable and make them pay for the externalities.

6.11 Conclusion

The implementation of IWRM in Malawi faces many challenges covered in this chapter. There is no debate about water resources availability in the form of lakes, rivers, and

aquifers. Water resource development infrastructures that include dams, policies in water resource development, irrigation, and sanitation are steps in the right direction. The lack of operation and maintenance of water and sanitation infrastructures remains a setback in IWRM implementation. The roles of various stakeholders outlined in national water and sanitation policies are clear, however overlaps create confusion. Financial management and sustainable development, enforcement of the Water Resources Act of 1969, and implementation of the Decentralisation Act of 1998 prior to the establishment of local authorities, are setbacks in the implementation of IWRM. The challenges of waterborne diseases, poor coverage in rural areas and schools, weak sector leadership, poor data, hydrological and climate change, were covered in this chapter. The context of IWRM implementation in Malawi was also discussed.

In this chapter the role of the MIWD, SRWB, Mpira Water Authority, WUAs, and tap and borehole committees were discussed as part of an IWRM institutional framework. The different pricing mechanisms used by the SRWB and the Mpira Water authority, and steps taken by health centres were presented. Lack of participation of households in tariff reforms were cited as examples of poor IWRM implementation. There are areas such as water and sanitation governance, institutional frameworks and mechanisms that need improvement. Property rights skewed in favour of private property and market mechanisms, have negative impacts on water supply and sanitation delivery. Even though the number of households that have access to water and sanitation is estimated to be above 70% in Ntcheu, Balaka, and Mangochi, water rationing and competing institutional mechanisms undermine sustainable access to water for everybody, always. High levels of pollution and lack of equity also poses problems. The next chapter presents a discussion and analysis of IWRM in Durban, South Africa.

Chapter Seven

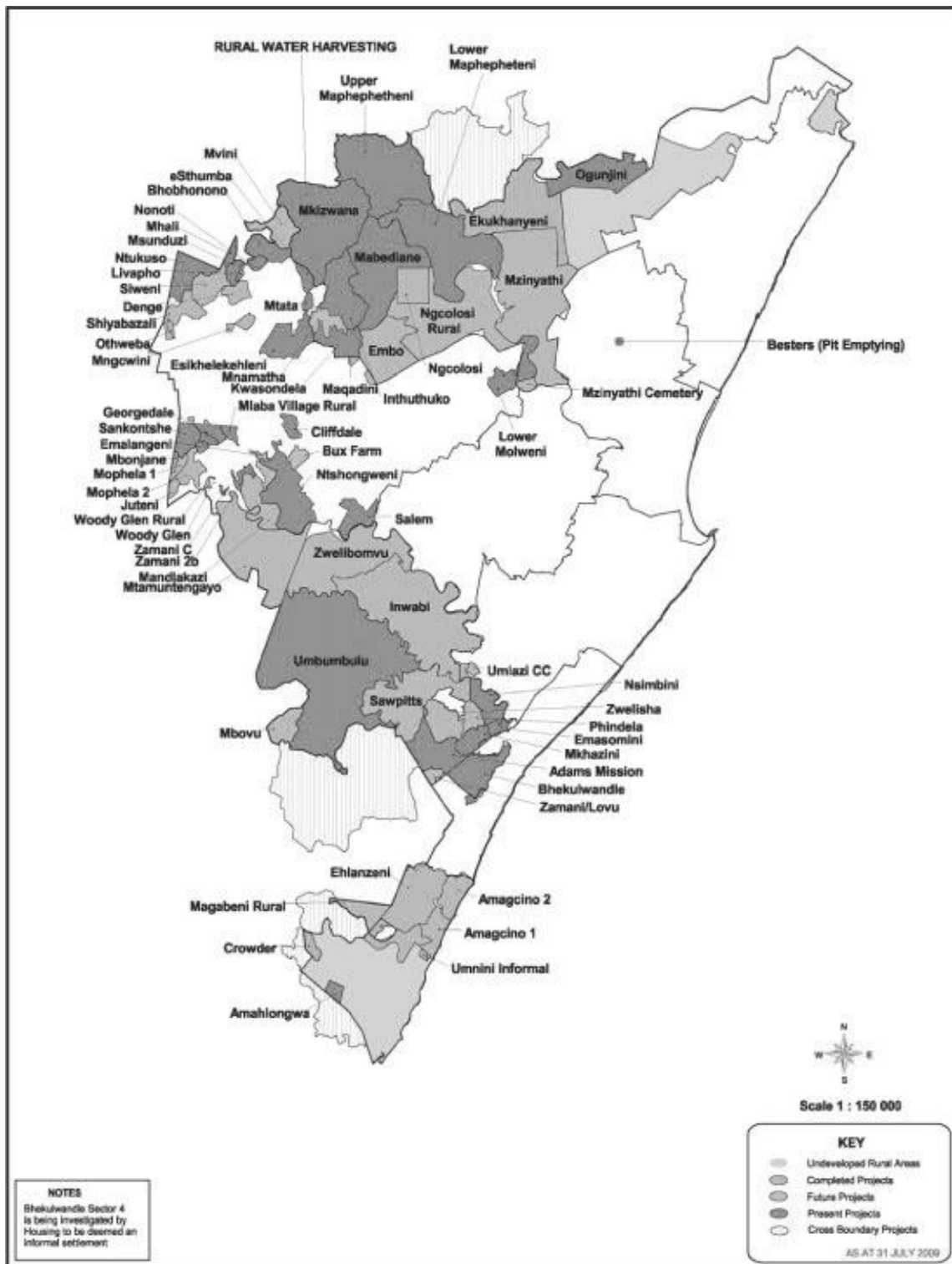
Durban's class-based Urine Diversion toilets

7.1 Introduction

There are two sides to the Durban rural sanitation story. One side is presented by the households who are unhappy with urine diversion (UD) toilets, and the other is represented by the councillors who authorised 90 000 UD toilets to be installed, and the municipal officials who designed and implemented this controversial project. The latter are supported by the eThekweni Water and Sanitation's (EWS's) receipt of many water and sanitation awards for being one of the best performing municipalities not only in South Africa, but the whole of Africa. As early as 2002 EWS was bestowed a National Geographic Award for Sanitation, followed by a 2003 Dubai International Award for Best Practices (for sewage disposal education), and in the same year the South African National 'Excellence in Innovation' Award, and the Ford Foundation's Impumelelo Award. EWS continued to be a recipient of the best municipal delivery award and 'Blue Drop' award from the national Department of Water Affairs. A sponsor of EWS, Bill Gates (2010), wrote in a blog that long-time EWS manager Neil Macleod "has been a leader in thinking through how to improve sanitation for the poor in Durban". In September 2014, Macleod and EWS were awarded the Stockholm Water Industry Award, the most prestigious of its type in the world.

Yet councillors who authorised the introduction of UD toilets find themselves under immense pressure from communities to oppose the scaling up of the project, whilst officials on the other hand continue with implementation. Officials did, however, change critical features in the UD system, revealing the limits of the IWRM full cost-recovery approach. One crucial U-turn was in May 2014 when the municipal council approved a \$3.5 million project for city employees to empty the UD containers (instead of it being the household's responsibility).

Figure 7.1 Map of Durban



Source: Ethekwini Municipality, 2010

A related question concerns the class nature of sanitation delivery in rural areas which are perceived by households as discriminatory, but on the basis of class segregation rather than racial apartheid (as practised by many National Party administrations since 1948). For these households, racial-based apartheid has been replaced by class apartheid and geographical discrimination; wealthier households of all races continue to flush their toilets while their low-income counterparts continue to face human waste in their daily lives. The ‘sanitation belt’ in the Durban municipality is the geographical manifestation of a class-biased sanitation policy.

Durban is a case study of sanitation implementation funded directly by rate payers. The local government is responsible for the conceptualisation and implementation of the UD toilet project. Unlike the Ghana and Malawi case studies where there is confusion regarding the role of local governments in water supply and sanitation provision, the Durban water and sanitation authority manages water and sanitation on the basis of a fully fledged local authority in line with IWRM principles of decentralisation. Durban is also a case study of local authority with democratically elected councillors who played a role in the choice of sanitation technology and crafting institutional mechanisms that influenced the roll-out of the project. It is a good example of what the technocrats who met in Dublin in 1992 did not anticipate: a municipality providing a subsidy to all its households, but with discrimination based on class and geography, resulting in a project being rejected by a large proportion of residents.

In this chapter, I present an overview of the UD toilet technology, pointing out how it contributed to class antagonism and geographical segregation in the city. I also argue that lack of equity, poor communication, lack of institutional focus, the closeness of UD toilets to areas provided with other technologies, and a lack of responsiveness to local issues, contributed to the rejection of UD toilets by households.

7.2 Urine Diversion technology, geography and class antagonism

With the extension of its boundaries in 2000, eThekweni Water was faced with the challenge of rolling out sanitation to households beyond what they came to term the

There is no dispute that this system is discriminatory. As Macleod (2014) himself expressed it in 2014 on the web video that highlighted his Stockholm Water Industry Award,

“...what we’ve realised is that into the future, we need to find new technologies that meet people’s expectations. The reality is that everyone believes that the flushing toilet is the best solution to sanitation.... we’ll bring safe sanitation at an acceptable level to rich and poor alike and we’ll do away with this perceived discrimination where the flushing toilet is seen to be for rich people and dry sanitation is seen to be a solution for poor people. Our challenge is to do away with that differentiation.”

But in the short-term, sanitation differentiation remained Durban’s public policy. Facing budget constraints and with the cost and future scarcity of water uppermost in mind, EWS did not consider low-flush septic tanks or biogas digesters as an option in the areas beyond the sanitation edge (Hawksworth, Acher, Rodda, Smith, Appleton and Buckley, 2006). There, EWS planners embraced UD toilets as an ‘affordable option’. Inside the edge (including sites like Hillcrest geographically distant from central Durban), flush toilets, with full sewerage service, along with flush toilets leading to household septic tanks are reserved for higher-income groups. Outside the edge as well as within it in scores of shack settlements, VIPs and UD toilets were predominantly built to serve peri-urban households and rural residents. (Later, shipping containers were also introduced in these lower-income areas.)

UDs are a dry sanitation system (without flush capacity) that diverts urine into sandy soil or collection container, leaving solid waste to dry out and decompose into human compost. Ash, dry soil, or sawdust is sprinkled over the faeces after defecation. The ash absorbs the moisture and also controls odours and flies. The toilets are built to be rotated between two chambers; once one is filled, the other is used while the first decomposes. The Durban UDs were initially not designed to harvest urine which is soaked into the yard or garden (Austin, 2006: 1, Duncker, Matsebe and Austin, 2006:5, Lutchiminarayan,

2007:15, Hawskworth, et. al., 2006). Later, pilot urine collection systems were devised that even held the promise of paying people for their urine, as a fertiliser ingredient.

The advantages of UD toilets are:

- The entire structure can be built above ground and there is no need for expensive digging and lining of pits.
- Urine is diverted; no water is used for flushing.
- The volume of the processing vault is fairly small as it is periodically emptied (Esrey, Gough, Rapaport, Sawyer, Simson-Hebert, Vargus and Winblad, 1998, Duncker, Matsebe and Austin, 2006:5).

The Water Research Commission conducted a study in 2006 that raised the issue of UD acceptance and the building standards used. In a study conducted by Duncker, Matsebe and Austin (2006) in the Northern Cape, the Eastern Cape, the North West and KwaZulu Natal (Umnini and eHlanzeni), sources of dissatisfaction were highlighted:

“The UD toilet was not the only toilet found in the yards of the respondents. Some households also used pit toilets and flush toilets. Some people who once experienced the use of flush toilets will under no circumstances accept UD toilets, with all the inconvenience associated with it. Pit toilets were still in use by especially children under the age of ten and by those households that did not use the UD toilets. Children under the age of 10 did not use UD toilets because the seat was usually too high, with fears expressed that they might fall into the vault. Proponents of IWRM and Community Led Total Sanitation advocate for consultation with communities for any type of technology to be accepted. In the case of UDs, no matter eThekweni officials’ claims to the contrary, many people were ill informed about the device. This affected their perceptions regarding the handling of human waste, as the vaults were designed to be emptied by households. The perceptions of people around handling of human excreta are negative, in no small part because of a very high disease burden, including Durban’s status as the world’s city with the highest HIV

positive population, and hence a high diarrhea prevalence. The difficulty in keeping excrement dry, with high levels of diarrhea and a very humid environment from November through March meant that many people resisted the task of emptying the UD's vaults. In most of Durban, the vaults were shallow, requiring regular emptying. Instructions to dig holes and plant fruit trees were not well communicated, or accepted."

Even in wealthy Durban, UDs were chosen because the full operating and maintenance costs are borne by households and no longer the municipality. Yet it soon became evident that removing and replacing the covering slab when emptying the vault, or unsealing the covering slab, are difficult tasks. If households wished to get additional support regarding equipment failure for instance doors which regularly needed replacing, it was difficult to locate community-based sanitation committees that could assist in replacing slabs, doors, vaults, and other spare parts. Though the formation of such sanitation committees was encouraged by the municipality and allied NGOs such as Mvula Trust, they did not survive for a long time. Moreover, in a bid to cut operating costs, environmental health officers and community health workers were only considered as part of the project during the construction phase. Another complicating factor was that in many cases UDs construction was not executed properly. For all these reasons, a substantial proportion of households in some of the case communities decided not to use or maintain the toilets. Some were not used as toilets at all but as storage places for building material or other valuables because it was the only place that could be locked. Some toilets were also used as animal pens or hen houses.

It was established by Roma, Philp, Buckley, Xulu and Scott (2013:307) that out of 17 448 households surveyed in Durban, 1 465 (8.4%) converted their UDs into flush toilets. Those who could not afford to convert their UDs into flush toilets continued to use their un-improved pit latrines. Roma et al (2013:307) found that 2 243 (14%) of UD recipient households preferred to use un-improved pit latrines. On the other hand, 12 760 (80%) households in Cliffdale, Masuku, Mnamatha, and Ngonweni much more easily adapted to the UDs, perhaps because they were not close to any community that used other types of

sanitation facilities. Finally, 1 117 (or 7%) of the recipients concentrated in the areas of Ngonoma, Wood Glen Rural, Mahlabathini, Msunduzi, Bux Farm, and Denge have never used UD, despite having received allocations (Roma, et al, 2013:308).

This set of problems is not unique to Durban. In sites across South Africa, Duncker (2005:2) recorded a variety of similar problems: poor design and construction, lack of community participation in project design, resistance to handling human waste, the perception that urine is harmful to plants, the sense that UD toilets are a sub-standard technology compared to flush toilets, and designer failure to take into account the different sanitation needs of men and women.

Can the UD system be reformed? Proponents of UD toilet technology (Guness, Jackson, Rodda, Smith, Trotter, Macleod and Buckley, 2004:4, Mnguni, Ndlovu, Gounden, Pfaff, Rodda and Buckley, 2008:1) acknowledge that buried UD waste has a potential negative impact on the quality of soil and groundwater but indicate that such effects can be mitigated through secondary treatment and sanitisation of human waste before reuse is recommended. Hawsworth et al., (2006) argue that the introduction of UD toilets reduces the chance of either surface or groundwater becoming polluted. New technical fixes that address odours, especially when faecal matter does not dry properly, are also being developed. Austin (2006:8) suggests a process of augmenting vaults to ensure a storage facility that keeps faeces for a period of 12 months to allow pathogens to die off for safe handling by households; an advance on the drying of faecal material in a pit during the filling phase (Brouckaert, Ridgway and Buckley, 2004). This is one of the standing concerns of households regarding the safety of handling waste in emptying toilets when both vaults are full. Although garden rakes, spades, and gloves are provided, the danger of being contaminated with pathogens is always a concern (Austin, 2006:1, Mnguni et. al, 2008:1).

Since the early stages of UD experimentation, grievances about UD have remained mostly unresolved. The toilets have become increasingly controversial, with strong supporters and strong community resistance. Lutchminarayan (2007) conducted a study

on UD toilets in the rural and peri-urban areas of Durban including eMzinyathi, Mtamuntengayo, and Sawpits, as well as areas in which UD toilets were not installed, such as Ogunjini, Adams Mission, and Bux Farm, with these findings:

- Only 16% of households with UD toilets never used them, whilst 77% of households stated that their UD toilets did not smell, 82% reporting no flies, and 79% reporting that the toilet pedestals are always clean (Lutchminarayan, 2007:68).
 - In the same study 23.6% of households surveyed at eMzinyathi reported that their UD toilets gave off odours, with 23% of Mtamuntengayo and Sawpits reporting a similar grievance (Lutchminarayan, 2007:70).
 - At eMzinyathi, 1% of households have flush toilets with sewerage facilities and 2.6% flush with septic tanks, with 94.4% having no flush capacity; 3.9% have ventilated improved pit latrines (VIP); 25.2% have pit latrines without ventilation; 3.2% open defecation: and 64.5% UD toilets. At Sawpits, 1.1% flush with sewerage facilities, 1.7 have septic tanks, 52.2% of households use UD toilets, 8.9% use VIPs, 25.6% use pit latrines without ventilation, 1.1% use buckets and 8.9% openly defecate (Lutchminarayan, 2007:71).
 - At Mtamuntengayo, the figures are: 48.9% UD toilets, 1% VIPs, 9.4% pit latrines without ventilation, 4.1% open defecation, and nobody surveyed had either sewerage facilities or septic tanks.
 - At Ogunjini 2.2% flushed with sewerage facilities and 25.3% with septic tanks, while 50.6% had pit latrines without ventilation, 1.1% buckets, and 20% open defecation (UD toilets were not yet installed) (Lutchminarayan, 2007:71).
 - At Bux Farm, 1.2% of households had septic tanks, 8.4% had VIP toilets, 45.8% had pit latrines without ventilation, 44.6% openly defecated, and no UD toilets were installed.
 - At Adams Mission, 11.5% of households had septic tanks, 65.6% pit latrines without ventilation, 6.4% with buckets, 16.6% openly defecated, and no one was provided with UD toilets (Lutchminarayan, 2007:68).

The utilisation rates varied. In Mtamuntengayo 55% of households with children under the age of 12 years used their UD toilets, while 41% resorted to open defecation. Children

under the age of 5 and those under the age of 15 have a high risk of contracting intestinal infections and helminth infestations, including cholera, typhoid and paratyphoid fevers, dysentery, hookworm, schistosomiasis, and filariasis, because of their weak immune systems (Mnguni, et. al, 2008:2). This finding contrasts with earlier findings by Ducker, Matsebe, and Austin (2006:98) that most children at eHlanzeni and eMnini did not use UD toilets. In both studies, very few households reported that they participated in hygiene awareness programmes (Lutchminarayan, 2007:70, Duncker, Matsebe and Austin, 2006:97). Duncker, Matsebe and Austin (2006:97) conclude that training focused on the operation and maintenance of UD toilets without reference to health and hygiene promotion. Such training would have included washing hands with soap after using a toilet, before cooking, when handling food, before eating, and before feeding babies. A key factor was the availability of hand washing facilities. Ironically, in spite of the lack of water, Lutchminarayan (2007:81) concludes that areas with UD toilets show better hygiene standards of toilets and hygiene practices than those without.

Hawksworth, Archer, Hanseen, Tromberg, Lutchminarayan, Knight, Smith, and Rodda (2008) tested 124 households in Mtamuntengayo and Sawpits and concluded that 90% of the households tested positive in ascaris and protozoan infections, suspected to be caused by open defecation in areas that are served with UD toilets. However those who used their UD toilets were also vulnerable to protozoan and ascaris infection. Hawksworth et al., (2008) conclude that the high level of infected households in rural areas is a cause for concern. Moilwa and Wilkinson (2006) conclude in a study conducted at Augrabies, Northern Cape that although health and hygiene promotion form part of water and sanitation projects, very little behavioural change was observed after the completion of the project cycle. Continuation of health and hygiene messages beyond the construction and vault-emptying phases could assist in changing low hygiene behavioural patterns to washing hands with soap after emptying a UD toilet, washing hands with soap after defecation, and before handling food (Moilwa and Wikinson, 2006:6).

In a study conducted at Zwelibomvu in Durban West (Mnguni, et. al., 2008) it was established that no hand washing facilities were provided, 42% of the toilets observed

had flies, and 84% of the waste burial sites were accessible to humans and had a very high risk of human exposure to residual faecal matter. Moilwa and Wilkinson (2006:4) found that two thirds of the households washed their hands with soap only, 28% washed their hands with both water and soap, and 3% washed hands with water and soil after emptying toilet vaults. Health and hygiene practices were never applied after an intensive programme of promoting such an initiative. Mnguni, et al. (2008) recommend the provision of more health and hygiene education, focusing on handling waste during excavation of UD vaults and the burial of same in pits of 250 cm depth, followed by planting trees as signs of identification. Guness, Pillay, Rodda, Smith, Buckley, and Macleod (2008) conclude that health-harming bacteria have the potential to re-grow either during storage or after the burial of human waste.

In 2014, EWS agreed to re-visit some of the unresolved concerns of the communities regarding vault emptying. The municipality agreed to fund workers to empty all the UD toilets in Durban, but poor workmanship was still not addressed except in the pilot houses chosen in 2012. The focus on emptying UDs will only take place in households that use their facilities. The decision was taken after studies conducted by both the municipality and UKZN revealed that acceptance of the UDs could improve if emptying facilities can be provided and paid for by the municipality (Roma et al, 2013).

As for poor construction techniques, in December 2012 the uMzinyathi, eSikebheni, and Lahlumlenze areas were identified as pilot areas where the city agreed to repair doors and poor workmanship. In houses occupied by people with disabilities, the municipality would also provide facilities big enough for people using wheel chairs. Some of the households identified in this study were meant to be beneficiaries of the repairs. All 30 households chosen to participate in the pilot phase of the toilet refurbishment benefitted through broken doors being fixed, new vaults being installed, and faecal matter being removed from both vaults (Interview with Dudu Khumalo and Teddy Gounden on 20 October 2012). Schools that initially used UDs and VIPs were upgraded to flush toilets linked to septic tanks as part of the project funded by the Department of Human

Settlements of which eThekweni Water is a service provider for the KZN province (Notes taken in a meeting between Teddy Gounden and uMphilo waManzi on 20 October 2014).

By June 2014 the emptying of all UD toilets by municipal staff or companies contracted by the municipality in a similar manner as the VIPs commenced after the approval of such an initiative was granted by eThekweni Human Settlement Committee chaired by Councillor Nigel Gumede. eThekweni Municipality confirmed in a media statement that:

“About R39 million has been set aside to empty 90 000 urine diversion (UD) toilets that could pose a health risk for Durban residents if left full. The city will implement a two-year programme to empty these specialised toilets in a safe and controlled way. The toilets operate without water and have a divider so that the user, with little effort, can divert the urine away from the faeces. The city’s head of water and sanitation, Neil Macleod, in a report tabled before the human settlement and infrastructure committee yesterday, said the approach thus far had been that the rural householder was responsible for emptying the toilets. Macleod said in peri-urban and some urban areas, the city had recently provided a pit emptying service to residents, with various types of toilets. “This has led to conflict with the original policy of rural homeowners being responsible for the UD toilets,” he said. According to Macleod, research had shown that although rural residents were happy to use the toilets, there was dissatisfaction about having to empty them. “Research has also shown some degree of health risk in the emptying process,” he said. The programme will provide free emptying services to alleviate health risks and the burden on householders. “Some residents in these communities are becoming more affluent and are installing higher levels of service in their houses,” said Macleod. This would result in a gradual decrease in the number of UD toilets as residents no longer qualified for the free service.” (Mpume Madlala, Natal Mercury, 04 June 2014).

This is regarded as a step in the right direction in terms of addressing some of the concerns of the communities although it is a drop in the ocean compared to the other grievances dealt with in the following sections. Moreover, if the “higher level of service”

entailed a flush of some sort, for instance to a septic tank, would such a realisation inform public policy? And if a flush septic tank toilet is permitted, then the next step would be a sewage system, but the geographical segregation that is core to UD installation was largely designed to avoid large bulk expenditures. With individual households unable to meet the expenditure of installing intermediate house-to-sewer connections and then sewer-to-treatment centre lines, the only way a household could graduate to a higher level of service in dense communities would be to move to a community that has intermediate connections to sewage piping. This is the essence of the geographical segregation that is cemented in by the choice of a water-less technology.

There are many other aspects of UD controversies that relate to the broader IWRM approach, but this chapter reviews only four issues which arose repeatedly in interviews, namely equity, communication, sensitivity to local contexts, and institutional focus.

Many of the areas where UDs were built are in close proximity, sometimes literally next door, to areas with flush toilets. Hawksworth et al., (2006) highlight the fact that more affluent communities have waterborne sewerage which is perceived as a prestigious system that all communities aspire to have. In some cases the areas with flush toilets were Reconstruction and Development Programme (RDP) houses. (Since 1994, the ANC government has been providing houses to low-income households free of charge as part of the RDP election manifesto of 1994.) Others were well-established middle-class households. At KwaNgcolosi in various sections of Wards 8 and 9, there are public facilities such as schools, clinics, and a traditional court that have flush toilets and or ventilated improved pit latrines. The trend at KwaNgcolosi can be discerned from interviews with typical households.

The Bongimpilo Creche situated at Mshazi does not have a UD, but is served through VIP latrines built by a long-serving NGO, Valley Trust. It was established that VIP latrines were no longer used since the institution was provided with flush toilets by donor agencies. The Ndlokolo Primary School and the Hlahlindlela High School utilise flush toilets. The Valley Trust toilets are either not utilised at all or only utilised if there are

mechanical water cut-offs in the area. The Sihlangusabasha and Labora Primary Schools are still using Valley Trust VIP latrines for both educators and pupils. The other public spaces visited were the local clinic and the traditional court. Both institutions have fully functional flush toilets. The eKuphikeni traditional court which operated in the 1980s as the Department of Home Affairs' offices, was the first public institution to have improved sanitation facilities, followed by the local clinic.

Mrs Ndlela, a community participant from eMshazi, KwaNgcolosi, laments that the eThekwini municipality is not taking her community seriously as residents:

“They could have asked us to dig our own pits that are deep like the Valley Trust toilets. We are provided with spades, rakes and shovels that we could use to empty toilets once both the chambers are full.”

Her argument is supported by Austin (2006:1) who wrote extensively about the low level of UD toilet acceptance in most parts of South Africa. Ndlela continues:

“Emptying toilets is not acceptable, that is why we have not done so. We don't want these toilets, and we are wondering why they built them. We have water in the dam (referring to Inanda dam whose construction in 1984 led to the displacement of 1080 households from Maphephetheni, KwaNgcolosi, KwaNyuswa and Amaqadi traditional areas) and why are we not using water from the dam to flush? Our schools and traditional court have flush toilets and why we do not have them?”

These are questions that have remained with the members of the 10 households that participated in the study. The views of Mrs Ndlela and her Ngcolosi community were also supported by councillor Tex Collins, a former DA Ward councillor responsible for Ward 8 and also a former eThekwini member of the executive committee. Ward 8 includes the areas of Ngcolosi, Waterfall, Hill Crest, Kwanogwaza, Molweni, Langerfontein, and Wushwini. Collins acknowledges that people have resisted the introduction of urine diversion toilets and that there is still a challenge in accepting them.

Placing human waste in their gardens, selling their urine, and emptying toilets when both chambers are full, are some of the grievances that people consistently raise. The unhappiness in the community is also highlighted in studies conducted in other parts of South Africa by Austin, (2006:4). Collins states:

“When UD’s were proposed, there was a lot of resistance, people were unhappy with putting waste in their gardens. The reason for that is that it is not socially acceptable to put human waste in the garden. The other reason for resistance is that rural communities were annoyed by the fact that they are expected to accept second best facilities compared to their urban counterparts. People base their argument on the fact that If flush toilets are provided in urban areas, why not in rural areas?”

He adds that urine diversion toilets are not dignified and that there is enough water in Durban for everyone to flush.

“People want dignity when it comes to toilets and people are not lazy to build their own toilets. If the city can provide people with material, they can build their own toilets. There is enough water to flush toilets in our city. People can flush using their tanks in their homes, e.g. one flush after everybody urinated could save water. For 45 years people were not given anything, people feel they are entitled to get something from the government.”

The Ngcolosi, Umnini, Amaqadi, and Embo residents reject the proposed move by the city to purchase urine to be used as fertiliser. They are happy with the use of cow dung and describe the trial policy as an insult. Several complained that because they are black, Zulu, and poor they are subjected to selling their urine for a living. Facilitators from Kwandeni, Wood Glen, and Zamani also reject the sale of urine because there are no facilities to harvest urine and it is socially unacceptable. For communities to accept UD toilets is therefore difficult, and to add the harvesting of urine could result in facilitators being rejected or even harmed while offering community education. In contrast, respondents from the Umbumbulu community cited no problems in the harvesting and

sale of urine, but raised concerns about the failure of the city to cater for people with disabilities, especially those who are wheelchair- bound.

A similar trend was observed at Embo which is situated next to the affluent white suburb of Botha's Hill where residents have flush toilets; Embo residents have urine diversion toilets. At KwaDinabakubo RDP households have flush toilets. In the Upper Molweni which includes Lower Molweni and other suburbs, there are either UD's, VIPs, or traditional latrines. Molweni is situated next to Waterfall, Cresthouse, the Valley of a Thousand Hills, and Hillcrest which are affluent white suburbs with flush toilets and modern amenities. Other areas that comprise Ward 9 are Wushwini, Umgababa, Lower Langerfontein, Madimeni, Roman Catholic 1 and 2, and KwaNgcolosi which are mainly serviced with UD toilets. In the South Coast, the residents of Magcino and Magabheni townships enjoy flush toilets while other rural areas within the Luthuli traditional authority such as Danganya, eHlanzeni, and Umnini, have UD's. The local schools such as Mnganuwakhe Secondary, Power Primary, and others are served with flush toilets which implies that the infrastructures to build flush toilets for everyone is available, and it is only lack of political will which prevents it. The municipality argued that the reason to build UD toilets was the fact that these areas were beyond the 'waterborne sanitation edge' where it is technically difficult to install sewerage facilities, but as suggested by the proximity of flush toilets in the white areas, this notion of a 'waterborne sanitation edge' illustrates another case of manufactured scarcity. It is an artificial geographical designation which leads to class antagonism.

In Ward 59 there is also a big divide between the services rendered to the Amaotana and Etiyeni areas that still have UD toilets, and their neighbours at Trennace Park that are served with flush toilets. Councillor Thoko Gumede noted that a toilet war has degenerated into a Zulu-Indian war because the predominantly Indian areas of Phoenix and Trennace Park are provided with flush toilets while the predominantly Zulu areas of eTiyeni and Amaotana are provided with UD toilets. Other areas such as Ohlange and Bhambayi have flush toilets on their premises included as part of the RDP houses roll-out. In the Durban West Region, the provision of UD toilets in areas such as Zamani,

Wood Glen, and Kwandeni which are situated next to Mpumalanga township which is served with flush toilets, precipitated resistance from the communities in accepting them. What complicated matters is that certain sections of Zamani, i.e. IA, and 2A were upgraded and provided with flush toilets while Sections 2B and 2C still have UD toilets; another instance which proves that the ‘sanitation edge’ has a clear class connotation.

The proximity of the Mpushini section of eMbumbulu to areas such as Adams Mission and eFolweni where communities enjoy flush toilets, is often cited as a cause of great concern by the communities. There is a general feeling that UD toilet construction is not sensitive to the needs of people with disabilities, the elderly, children, women, and therefore lacks equity. Former councillor Mweliso from the Sankotshe area near Mpumalanga Township had an experience to share about how UD construction discriminates against the elderly.

“I have a UD in my household at Sankotshe area of Ward 5, it is not user friendly especially during the wet seasons therefore my family resorted to use our previous traditional pit latrine. Factors that motivated us not to use the UDs is that it is not suitable for old people who may not have the energy to climb on the stairs and it is not suitable for people with disabilities using wheel chairs. My parents are both wheel-chair-bound and they are unable to climb the stairs each time they visit the toilet. There should always be somebody that goes with them each time they visit the toilet. As communities, we were not given choices about which facilities we preferred, and UDs were imposed.”

Facilitators responsible for health and hygiene education in nearby Zamani agree with councillor Mweliso that people with disabilities were not catered for; at Wood Glen for example, toilets with stairs were constructed in houses with people living with disabilities. In certain areas this was avoided. Some of the perceptions that users of UD toilets grapple with is that they are sub-standard, poorly constructed, gender insensitive, and that their construction lacks participatory and community acceptance (Duncker, 2009). This contrasts with the findings by Moilwa and Wilkinson (2006:5) that vault

emptying does not have a stereotypical gender bias and that both sexes are exposed to microbial risk from vault emptying.

Councillor Mngadi who resides in Ward 98 and has a traditional home at uMbumbulu, cited her inability to use a UD toilet because they are not designed for females.

“When trying to use a UD in my Umbumbulu rural home, I could not because the urinal is designed for men and not for us females. It is situated very high and only a standing man is able to use it.”

Mrs. Nokulunga Dolly Ndlovu, the chairperson of the Lizalise Palliate Care Centre situated in the Mpushini area of Umbumbulu, highlighted the plight of people with disabilities as follows:

“My husband who is wheel-chair-bound is not using a UD, because it is small and stairs were constructed and it is not possible to drive in a toilet using a wheel chair. When I requested a bigger toilet they simply built another one without stairs and the size is still the same and the wheel chair could still not be driven in and out of the toilet. Children are also unable to use it as the urinals are situated far up. There are flush toilets at Mpushini Primary School which is a few metres away from the Centre. People that complained about poorly constructed toilets were insulted by construction workers. If you complain, they would swear at you. People with disabilities were called by names when they raised concerns about the type of sanitation facilities that were constructed and this promoted discrimination. For us it was a quadruple discrimination, we live with disabilities, we are Zulu, we are poor and we live in rural areas. Even people that live with disabilities that frequently visit the Palliate Care Centre find it difficult to spend time here because we do not have sanitation facilities that are suitable to their disability situation”.

A former project steering committee member for Wards 100, 96, and 93 which caters for the Sobonakhona traditional authority, Sipho V. Dlamini, came to a similar conclusion,

namely that the eThekweni municipality use UD toilets to discriminate against some of its citizens:

“eThekweni Municipality introduced UD toilets in our areas because we are black, it is discriminatory and looking down upon us simply because we are black. We are not provided with good facilities, simply because we are black. Our IsiZulu speaking mayor and councillors are just like coats placed in a garden to intimidate rabbits and prevent them from eating crops, if rabbits could be made aware that they are intimidated by hanging coats they could simply eat everything in the garden. When coming to constructing poor facilities in black areas, eThekweni Municipality is just the same as the previous apartheid government, they are just whites in black skins.”

Mrs Ntshapha who resides in Zamani B agrees with Dlamini that “the municipality cannot build such toilets in areas where whites live. They did this because we are black, Zulu and poor.” Other Zamani residents Mrs Meyiwa, Ndlovu, Miss Hlophe, Mrs. Mkhize, Khomo, and Ngubane agree with Mrs. Ntshapha regarding discrimination.

“No explanation was provided regarding why the municipality decided to construct UD toilets in this area. We thought it was a temporal measure whilst RDP houses were under construction. When building RDP houses, flush toilets and not UDs are constructed. RDP houses were promised, but they were never delivered. Only Sections 4 and 6 have RDP houses and we were excluded. We were excluded because the former KZN Member of the Executive Committee for Rural Development, Environment and Agriculture, Meshack Hadebe regarded this area as a zoo and therefore was not suitable for further development. In every meeting that Hadebe attended he referred to us as animals that live in a zoo that do not deserve modern day amenities such as flush toilets”.

Former MEC Hadebe was demoted by the ruling ANC to the position of KZN Deputy Speaker of the Legislature after the May 2014 general elections, for making inappropriate comments while addressing an election rally (he argued, in Zuma’s presence, that voters

who do not vote for the ANC will lose their pensions and child support grants, which was interpreted as using child support grant and pension benefits to buy votes in a similar manner that the Inkatha Freedom Party leader Mangosuthu Buthelezi used state institutions to maintain his party's hegemony in KZN from 1994 to 2004).

The local headman of the Ngonweni area under the AmaQadi traditional authority, induna Ngcobo, highlighted the fact that UD's are used as a tool to discriminate against Amazulu and rural communities. The town planners and promoters of these projects live in the affluent suburbs of Umhlanga Rocks, and design sub-standard facilities for rural areas in which they do not live.

“Our citizenship, democratic and constitutional right to water and sanitation and dignity is violated by the municipality, when it comes to services to rural black communities, they argue that they have no money, but they have money for 2010 soccer stadiums, speed humps, swimming pools and other amenities they construct exclusively in urban areas. We live next to a very big dam here, but we are worse off when it comes to water and sanitation. This government is showing no respect for us. Instead of giving us flush toilets, they are asking us to collect our urine and sell it to them. If selling urine is good, why are they not doing it in urban areas, if UD toilets are good why they do not build them in urban areas?”

These are the questions that induna Ngcobo and his Ngonweni subjects believe were never resolved by the eThekweni Municipality. To a group of people already sensitive about the vestiges of inequality under apartheid, this proximity raises questions. How can they have waterborne sewerage and we cannot? Some households have done their own “upgrades” to flush toilets with septic systems built by local plumbers. Another key problem related to lack of equity is the lack of communication with beneficiaries of the projects.

7.3 Communication gaps

Many problems can be traced back to either poor communication with households or a lack of communication. Councillors claim that communities were consulted adequately before UD were installed while communities claim that eThekweni used a top-down approach (Roma, Buckley, Jefferson and Jeffrey, 2010:589). A former municipal councillor Njabulo Ntanzu who participated in the study highlighted the following issues regarding consultations:

“I was part of the decision to install the UD in which the anticipated improvement in terms of health and costs were highlighted by the officials after they conducted studies. What impressed us is that there are no emptying costs as faecal matter dry and decompose easily. The UD is good because, no flies enter the toilet facility; and no solid waste disposal budget would be set aside to empty toilets since the communities would do this on their own. I accompanied the officials when they went to present this project to the community. Community representatives were part of the decision-making processes. A draft Integrated Development Plan (IDP) was presented to communities and the Council. This was subsequently followed by convening Imbizo IDP Forum in which councillors, communities and officials extensively participated. The people were given an opportunity to highlight the needs of their ward. The IDP responded to the needs of the community. Water and sanitation formed part of the IDP although it was not number 1 priority.”

Similar reasons for the choice of UD toilets were cited by Austin (2006:1). The above statement is supported by other councillors who claim that they saw the value of UD toilets in other areas and fully consulted their communities before implementation. Councillor Mbongelwa Phetha claims that the suggestions came from communities because of the un-hygienic nature of pit latrines without ventilation which most households used before the introduction of the UD. Communities were given an option to dig pits for ventilated improved pit latrines and when they resisted, were given the option of UD. The type of toilets that were to be constructed was initially built in demonstration houses and the facilitators in the communities visited each household to explain toilet usage and maintenance procedures including health and hygiene promotion.

Councillor Collins claims, “the Infrastructure Committee did a research about sanitation options suitable for rural areas. Various affected communities were consulted about the proposed plans. The consultations were extensive”. The importance of appropriate health and hygiene education as well as consultations are emphasised by Austin (2006:1) as critical to the acceptability of UD.

At Kwangcolosi, households claimed that there were no meetings convened in which the municipality presented UD toilets or other options which they were expected to choose from. Ward councillors on the other hand claim that there were various meetings in which communities were consulted. Members of project steering committees, facilitators, and the technical steering committee are divided on the issue of consultation. Lack of consultation features strongly in the reasons for the households’ rejection of UD toilets. At Umgababa, Umnini, Magcino, eHlanzeni, and Danganye, most households thought that the introduction of the UD toilets was simply a continuation of the flush toilet project still supposed to be rolled out from Magcino to other areas. There are households that have both flush toilets and UD toilets and they claim that the UD toilets were installed while they were away from their houses.

In many areas where grievances are expressed, the materials used to construct the UD toilets were of poor quality and approval from municipal building inspectors was guaranteed through apparently illicit means. The toilets were poorly constructed and most of them broke down even during the construction phase. There were no avenues that communities could use to complain about the poor workmanship because most of the construction camps were either relocated or combined with other municipal wards as a result of the demarcation process.

Some councillors agreed with the allegations made by communities that consultations did not take place prior to the installation of the UD toilets. According to Councillor Thabo Bhengu, “There is a lack of community ownership which resulted in structures such as the project steering committee, technical management committee, and facilitation teams becoming dysfunctional.” The lack of options and the imposition of UD were repeated

again and again. This is not surprising since eThekwini says it was in no position to consult on options since no other option existed within its budget. This approach has backfired. Being consulted is important to people, if only to tell them about the limitations and to make them realise that there is only one option (if that is the case).

The agendas of users are always not incorporated in project design and implementation (Roma et. al. 2010:590, Duncker, 2009:1). Communication was the responsibility of the institutional support developers (ISDs), which were appointed by the municipality on the recommendations of ward committees. There was a gap in communication between officials and politicians; for example members of the community claim that there is still an overdue, outstanding R400 connection fee which was charged by the municipality when the UD toilets were installed. However, officials and councillors claim that no charges were levied given that the project was a poverty alleviation initiative. Some communities acknowledge that health and hygiene promotion was part of the project, but indicate that it appeared to be a once-off intervention which only took place during the construction phase.

During the installation process, facilitators explained to households the procedures they needed to follow when emptying the toilets using the rakes and spades they were provided with, and pouring sand in a pit during each and every toilet visit. Washing hands with soap after defecation did not form part of the protocol due to the fact that toilet facilities were situated far away from the grey tanks and taps that were provided. The cups that the municipality provided in each of the households pouring sand into the pits so that the faecal matter could decompose were not meant for washing hands. Communities were advised not to bring water close to the toilets because washing toilets with water would defeat the purpose of dry sanitation, would catalyse smells, and would make decomposition take longer (notes taken in an Interview with Teddy Gounden in 2011).

For the communities of eMagcino, Umnini, Danganya, and eHlanzeni, no health and hygiene promotion was provided. Some households discovered that UD toilets were

constructed without their consent even though they did not request them. This highlights the lack of communication between the municipality and the communities. Households also claimed that the criterion used to appoint facilitators, and TMC and PSC members, was active participation in various structures of the ruling ANC. Those who were not active members were excluded. This claim was repeated again and again at Kwangcolosi, Ngonweni, Mpushini, and Zamani.

The facilitators responsible for training at Kwandeni, Wood Glen, and Zamani noted that the selection of facilitators was the prerogative of the ward councillor; naturally this means the process can become highly politicised. The facilitators also claimed that they did provide comprehensive health and hygiene education which included hand washing, waste disposal, locating toilets away from houses, and the implementation of a “one home one garden” campaign. A facilitator who also based at Zamani B praised the quality of health and hygiene education:

“The health and hygiene education that households were provided with includes hand washing with soap, keeping rubbish such as disposable napkins that are not decomposable out of toilet pits, cleaning and operating toilets as well as general maintenance of UD's. Facilitators conducted a door to door campaign educating households. Health and hygiene education was provided before construction, during construction and during the handover stage. Every 6 out of 10 households handle UD's properly. Education provided was good to our best of knowledge.”

However, this claim is disputed by various households. Mrs Ntshapa from Zamani B states:

“No information was provided, we just saw people constructing toilets, calling it development. We did not participate in deciding what type of development is a priority for us. It was just top-down approach. I was not happy about the failure of the local councillor and the municipality to convene a community meeting, also the

failure on the part of the municipality to give us various choices and options. We would have preferred to start by installation of electricity before toilets”.

Another group of households, also from Zamani which includes the Mkhize, Khomo, and Ngubane households noted that instead of health and hygiene promotion, a spokesperson states:

“We were given a bucket, spade, and a rake including basic education on how to use it. We were told that if you do not accept a toilet, you will not get an RDP house. No meeting was convened to explain anything. Those who were responsible for health and hygiene education simply left their pamphlets with anyone they found at home during their visit. All the things they said when they gave us tools to clean toilets are not at all happening. They said that if the toilet is full, one could empty it with ease, unfortunately it is not easy as the toilet smells very bad. They also indicated that it is up to you to decide what to do with the faeces after emptying the toilet. We do not have electricity, water and RDP houses in this area, despite having accepted UD toilets as a condition to get RDP houses. Our toilets are full, the municipality promised us that they will empty the toilets in each and every time after one year or six to twelve months, but to date they have not done so. People that provided health and hygiene education have since left the project. In the community meeting we held a year ago, we raised the issue of toilets, but up until now nothing has happened. In every meeting the issue of toilets was raised consistently. The pits are shallow and in large families toilets fill up easily.”

A representative from the Meyiwa, Ndlovu, and Hlophe households claims:

“The health and hygiene education provided was not good at all. We were only provided with equipment that we could use to empty toilets and basic skills such as use of toilet paper only, washing hands after defecation was not part of the education provided. The emphasis was on how to empty them. Other people still use newspapers instead of toilet paper, because of poor health and hygiene education that

was provided. No explanation was provided on how to clean the toilet seats. We were told not to put water inside the toilet pit, but there are instances where girls are menstruating and blood stains drop inside the pit and get mixed with faeces.”

In the Mpushini area of eMbumbulu, households claim that “no health and hygiene education was provided besides toilet usage protocols.” One member of a household states:

“The facilitators that handed over toilets were very impatient and handover in most instances did not even last for more than 5 minutes. No visitations took place after the handover, no explanation was provided and the focus was on ensuring that households sign to authorise that their toilets were completed. Children pour faeces in urinals and that results in most latrines blocking even if one use detergents the smell refuse to go away. Children sometimes pour sand in urinals and the whole system blocks and there is no one to help as the site office relocated to an unknown place”.

In Ngonweni, households were also not impressed about the standard of health and hygiene education that the municipality claimed to have provided. “We were given user guides such as things that should not be put in toilet pits such as newspapers and that was provided as part of a door to door campaign,” commented 50-year old Mrs Mdlalose. According to another commentator, the standard of health and hygiene education was very poor and was limited to the distribution of spades, cups, rakes, and jugs which people were meant to use when they defecated and emptied the toilets. “This was just a handover process and it lasted for few minutes and it should not be called health and hygiene education,” commented Ngwenya.

7.4 Insensitivity to local context and institutions

Specific issues need attention in different areas. For example wheelchair access could have been prioritised during the construction phase of the project. There was no need to provide households living with disabilities with two UD's; a single toilet that is accessible

to someone using a wheel chair would suffice. The fact that areas served with UD toilets were in close proximity to areas with flush toilets highlights the lack of sensitivity to local dynamics. The municipality could have utilised the services of Durban Solid Waste to ensure that everyone has access to black plastic bags for the disposal of sanitary pads and other solid waste. The Durban Botanical Gardens could have assisted with providing trees to plant as suggested by the proponents of UD toilets and the municipality could have explored emptying toilets in a similar manner that they are using with VIPs, even if it is only for the pilot phase. Although emptying UDs is budgeted for in the 2014-2015 financial year as indicated in the previous section of this chapter, it is important for the municipality to address all the issues identified in this study as well as those identified by Roma et al (2013) below.

Even if, based on surveys of 17 448 UD recipients, as many as 14 319 (90%) of households received information about how to use UDs and 1073 (6.7%) did not receive such information (Roma et al, 2013:308), it is clear that UD usage information is not to the same level as health and hygiene promotion. The job creation objectives that resulted in councillors approving UD projects did not yield impressive results. Roma et al (2013:308) observe that only 2 196 (13.7%) households observed increased job creation as a result of UD projects whereas 13 254 (83.3%) believed that UDs did not contribute towards job creation. Other challenges such as smells from toilets, lack of privacy from doors not closing properly, poor materials and workmanship for construction, and urine pipes that were not properly constructed (Roma et al, 2013:308), are residual problems. With 11 130 (64%) of the households surveyed not satisfied with their UDs (Roma et al, 2013:308), even if the municipality takes over the emptying excrement, people will still be dissatisfied because the grievances result from a combination of the many issues noted above as well as those in the next sections of this chapter. For instance, eThekweni Water could have acted on allegations of water pollution reported in Joint Services Board (JSB) constructed boreholes.

There are two institutional factors associated with eThekweni's imposition of UDs. The first is that the eThekweni municipality, especially EWS, is driven by technical people

with engineering backgrounds and the enterprise lacks grounding in basic community development skills. It is not simply a lack of human resources in this area; recognition that these skills need to be prioritised and valued alongside technical skills rather than treated as an after-thought that existing project managers or consultants can take care of, is important (Roma et. al, .2010:589).

Secondly, officials are ultimately accountable to the council which means that they must “tow the line” and attend to top-down dynamics. This places them in an invidious situation which limits what they can and cannot do. The institutional mechanisms and institutions that were established to promote the introduction of water and sanitation projects in the eThekweni municipal jurisdiction were: a project steering committee (PSC), a technical management committee (TMC), a clerk of works, project managers (PM), institutional support development (ISD) consultants, and health and hygiene education facilitators. The institutional support development (ISDs) consultants were appointed by the eThekweni municipal officials in accordance with procurement policies. The PSC, TMC, and facilitators were appointed by ward councillors in consultation with communities and their ward committees (WCs). Building materials were kept at project sites where, members of the communities who had technical queries could go and request either a member of a PSC, TMC, or a facilitator to resolve.

The experiences of the various institutions established to implement the UD toilet project varied from community to community and councillor to councillor amongst more than one hundred respondents who participated in the study. In certain areas, such as Zamani, Kwandeni, Wood Glen, and the areas next to the Mpumalanga Township, Embo and KwaNgcolosi facilitators, TMC, PSC and ward committee members are still visible and operational. In other areas, such as Mphushini in eMbumbulu, uMnini, and Ngonweni, municipally-driven institutions have collapsed and by 2014 project sites have either been relocated or shut down and communities no longer have mechanisms for further recourse. Even in areas where such institutions still exist, the perception of ordinary people about the usefulness of the structures vary, depending on how close they were to decision-making individuals. Some of the people indicated that they were not involved in the

election of these institutions and cited that political interference and ANC hegemony inhibited ownership and inclusiveness of the structures.

In Ward 8 which includes the areas of KwaNgcolosi, Molweni, Hillcrest, KwaNogwaza, and Langerfontein, the DA ward councillor at that time worked hand- in-hand with the ANC's party representative councillor (Ntombi Ndlela) and the IFP's party representative (councillor Mpungose) to identify members of the PSC, TMC, facilitators, and contractors who procured various services in various stages of the project cycle. Each party appointed at least three service providers including facilitators. Councillor Ndlela pointed out that the number of facilitators increased to about 40 in various stages of the project cycle. PSC, TMC, and ward committee members were paid allowances for each of the meetings that they attended.

In their interviews, both Collins and Ndlela agreed that white residents did not participate in the election of the ward committees; indeed this committee was one of the few such ward committees not under the chairmanship of the ward councillor. It was chaired instead by a member of the community. Collins cites the ferrying of busloads of ANC members to meetings as the reason why the few whites who attended the meeting declined to be nominated, and Ndlela cites the cocooning culture amongst whites as the reason why they prefer to work through ratepayer's associations rather than ward committees. Councillor Mpungose cited the politicisation of development by the ANC as the prime reason why the institutions created are not inclusive and why the attempts by residents of Lower Molweni to seek recourse through the Human Rights Commission and the Public Protector for violation of their water and sanitation rights were unsuccessful; ANC members supported the UD implementation even where residents were opposed to it.

At uMnini, Ngonweni, Mshazi, Embo, Zamani, and Mpushini, ANC hegemony was cited as the reason why communities were excluded from the election and appointment of PSCs, TMCs, and facilitators. In all these areas the former ward councillors Stanley Xulu, Zakithi Magubane, Mbongelwa Phetha, Njabulo Ntanzu, and Tana Magwaza exclusively

appointed ANC activists. Traditional leaders and other community members who are not associated with branch executive committee members of the ANC were excluded. In all these areas, members of the community alleged that active members of the ANC are served with flush toilets and those who are not associated with the ruling party are served with UD toilets. At KwaNgcolosi community participants argued that the PSC, TMC, and facilitators are dysfunctional. They further alleged that only ANC members participated in meetings, and that some leaders they accuse including an inkosi Bhekisisa Bhengu, an ANC Member of the KZN Provincial Parliament and the chairperson of the environment portfolio committee member, and former Councillor Phetha prevented people without ANC membership cards from participating in meetings and having a say in development. In an interview, Phetha disputed that political interference by the ANC is the reason for the dysfunctionality of the institutions and the under-utilisation of sanitation facilities. He cited misuse of the facilities as the main reason for failure and insisted that there was democratic participation in the election of the PSC and TMC, and the appointment of facilitators.

“The community members met to elect facilitators, project steering committee members as well as the technical management committee. Facilitators conducted research in the area, collected data about living conditions in each household. Households with eight members were allocated one UD and those with more than eight were allocated an additional UD. The data collection was conducted in various stages of the project cycle and it was coupled with provision of health and hygiene education. Households were informed about the type of toilet facilities they were about to get, they were further provided with spades, rakes and cups they could use to fill sand in the pit to allow faecal matter to decompose. UDs were designed in such a manner that faecal matter would be kept dry and decompose naturally once sand is poured every after defecation has taken place. Toilets are becoming full before their full one year life cycle because of misuse and because some families are more than the stipulated number. Initially households were supposed to dig their pits, unfortunately most households refused. Misuse of the toilet facilities includes mixing faecal matter and urine and other liquid substances. What complicated the matter

further is that most of the houses belong to landlords who do not live in the area and let out their houses to tenants who are not complying with toilet usage protocols. Vandalisms, broken doors and mixing of urine and faecal matter are very common especially in houses occupied by tenants.”

Phetha added that the project created employment opportunities and skills transfer, and promoted technical engagement between communities and municipal officials. He elaborates on how this happened:

“The Health and Hygiene Education ISDs were identified by officials through an open tender process. Once consultants were appointed, they were given further staff compliment drawn from communities in which they were going to operate. People with a minimum grade 12 qualification were identified and elected by their people from their areas. ISDs are accountable and contractually obliged to present high quality health and hygiene education. The process of working with ISDs was a good experience as it created employment opportunities in the area, skills were transferred from ISDs to local people that resulted in many of our youth securing full time employment with consultancies. Members of the community played an important role in selecting members of the Technical Management Committee as well as Project Steering Committee. Apart from members of the community, clerks of work, engineer, ISDs and project manager participates in PSC. Ordinary people managed to share their views with PSC, TMC, an engineer, clerk of work and project managers.”

That view is supported by Ndlela, Ntanzi, Collins, and others who served as members of the PSC and TMC, and the facilitators. One PSC member from eHlanzeni disputed whether the institutions created to implement the UD projects functioned as well as they were supposed to. He observed how building inspectors approved toilets that were falling apart during the construction phase. Poor workmanship was condoned by the PSC, TMC, and facilitators; tragically in one example, certification of unsafe structures resulted in the death of Mr. Mdabe in the South Coast when an approved toilet collapsed whilst he was inside defecating. Mngadi even admitted,

“The quality of the materials that were used to construct the toilets was of poor standard. Doors and corrugated iron roof that they used were of poor quality, broke down during the construction phase and were not replaced. There is no evidence of vandalism taking place in certain areas, and it points to the problem of poor quality of material used to construct the toilets that is responsible for the breakdown.”

For Sipho Dlamini the problem with the PSC, TMC, and facilitators was beyond just the poor quality of condoned materials. Neither of the structures created to monitor the UD's nor the councillors raised concerns about them. And even job creation benefited only members of the ANC. What complicated matters at Mpushini is that Magwaza left the area and settled in the affluent Amanzimtoti and his assistant, Madondo alienated members of the community when he accumulated wealth and appointed people on the basis of their party affiliations. Members of the Sobonakhona traditional council were also alienated by Magwaza and Madondo's actions. Dlamini resigned from the PSC since the clerk of works Mrs Buthelezi, no longer invited him to PSC meetings because he was not part of Councillor Tana Magwaza's inner political circle. A member of the Sobonakhona traditional council, Mrs Dolly Ndlovu, noted that political infighting amongst members of the ANC resulted in difficulties for the council to work with the PSC, TMC, and Magwaza. The internal conflicts also meant that the TMC, PSC, and facilitators began to resign. Another complicating factor was the conflict between Magwaza and the IFP party representative councillor, Pretty Mhlongo.

Political in-fighting amongst ANC members was also cited as the reason why the residents of Wood Glen demolished their UD toilets; this resulted in the halt of the project which only resumed when the in-fighting was over. At Ngonweni the site office relocated to Matata where the then ward councillor Zakithi Magubane resides. All PSC and TMC members, contractors, and facilitators were active members of the ANC and no-one came from Ngonweni. They were either from Matikwe, Umzinyathi, and Matata which are regarded as the strongholds of the ANC. The AmaQadi traditional authority and the Qadi development committee were two of the structures which were excluded

when TMC and PSC members were appointed. Ngonweni is not represented in any ward committee and therefore job creation and other benefits accrued from the project did not benefit anyone in this area.

At Zamani, KwaNdeni, Wood Glen, and surrounding areas, the TMC, PSC, and facilitators are still vibrant and were left with a few toilets to hand over before they focused on the water provision project. All 9 members of the PSC and the 5 facilitators responsible for Zamani B are still active and the site office and clerk of works visit the site 3 times a week; the project manager and ISD are also still active in the implementation of the project. The ISD, PSC, and TMC meet once a month to receive progress reports and PSC members report back to the community who elected them. Any member of the public who has concerns is welcome to visit the project office to meet with the ISD, TMC, and or facilitators. The facilitators are under the management of the supervisor and all operate from the project office. In Wards 8 and 9 where about 700 and 608 UD toilets were constructed respectively, strong institutional mechanisms were cited as the reason for these significant strides. In both the wards, site offices still exist and structures such as the PSC, TMC, and facilitators are still active. The communities of both these wards are still not happy despite strong institutional mechanisms. The community participants at Zamani B complained about emptying their toilets, carrying a bucket of sand each time they defecated, the smell from the toilets, the shallow pits, poor materials used which resulted in broken doors, and the political appointment of structures, as reasons for their non-acceptance of these facilities. Other reasons for lack of acceptance even if there are strong institutional mechanisms, are perceived discrimination, the provision of dry sanitation in areas with flush toilets, and the lack of municipal support in emptying the toilets.

7.5 Conclusion

There is no doubt that the implementation of UD toilets in the rural areas of Durban is still associated with class-based discrimination. That discrimination comes, in turn, from the cost-recovery orientation typical of IWRM. Its application in a decentralised mode in Durban reflects excessive municipal power to alter the national sanitation policy system,

which from 1994 onwards included the ‘eradication’ of bucket-system toilets. Yet the UD toilets are very much within the class of the bucket system, since the excrement is collected in a bucket-like container, and, psychologically, since so many households regard the provision of such toilets as lowering their dignity. These households are predominantly low-income and black; they are people who live with disabilities, women, and people who are not part of the ruling elites. In reaction, there are diverse forms of collective action, such as periodic protests and, in one case, demolition of the UD latrines at Wood Glen. The excessive emphasis on cost recovery, the weak institutional mechanisms, and the difficult community management of the facilities are some of the challenges that households continue to grapple with in Durban, as they do in so many other sites of IWRM implementation.

Can the system be repaired? In zoning the allocation of sanitation facilities, and in health and hygiene promotion, it is imperative that the municipality urgently attends to equity issues by taking steps to move middle class areas toward dry sanitation or lower flush toilets through changes in the regulations and/or incentives otherwise flush toilets will continue to be perceived as the privilege of the ‘petit bourgeoisie’, and UDs as a ‘curse’ for being part of the ‘class’ of poor people. It is also imperative for EWS to attend to outstanding technical issues raised by households such as hand washing, repair of facilities, and the implementation of a new round of health and hygiene education. There is also a need to consistently ensure that there are mechanisms for households to raise issues or get attention to their queries relatively easily, for example site offices, household visits by health and hygiene workers, and programmes aligned with community-led total sanitation principles that are in line with watershed management.

Chapter Eight

Manufactured water and sanitation scarcity in Africa

8.1 Introduction

This chapter analyses and discusses the key findings for each of the research questions and links them with primary and secondary findings. In this chapter, the principles, characteristics, benefits, challenges, and barriers that feature prominently in all three case studies are revisited. In short, economic affordability and not physical scarcity in a context of inappropriate water governance, is the reason why rural inhabitants in most African countries lack access to water and sanitation services.

The chapter provides conclusions about the implications of IWRM as a catalyst for rural water and sanitation poverty in Africa, continuing with the background theoretical framings which addresses water and sanitation governance, new institutional economics, and ecological economics. All of the above place the implementation of IWRM at the centre of manufactured water and sanitation scarcity in rural and peri-urban areas of Africa. The conclusions drawn are not limited to the case studies of Ghana, South Africa, and Malawi, but help to cast light on water and sanitation scarcity in many developing countries in general and Africa in particular.

The main conclusion is that sponsors of IWRM implementation are perpetuating water and sanitation scarcity in Africa. Decentralisation of water and sanitation can certainly contribute to greater social benefits to local stakeholders, but must be accompanied by necessary fiscal and technical support. The other lesson is that inappropriate water governance models adopted by developing countries result in water and sanitation scarcity in rural areas, especially when cost recovery becomes a crucial determinant of who gets access to water and sanitation services.

8.2 IWRM and the scarcity of participation and accountability

Economic affordability is the central determinant of whether people have access to water in each of the three cases studies, given that IWRM emphasises water as an economic

good. But this is a complex process with all manner of scapegoats. South Africa provides many examples, exemplified by the way access to waterborne sanitation in Durban is said to be limited by hydrological boundaries, by a 'sanitation edge'. Rural households are expected to maintain their sub-standard toilets, whereas urban counterparts are not expected to empty VIP toilets or use UD technology, for wealthier neighbourhoods have flush toilets.

What we have come to understand is that the scale of governance is critical to interpreting the water delivery challenge. In Durban the provision of sanitation facilities remains the responsibility of the municipality. But the Department of Human Settlements at provincial and national levels provides funding, and indeed formal housing projects and finance often determine sanitation policy, although the Department of Water and Sanitation is the overall sector leader. The lack of coordination between the Department of Water and Sanitation, the Department of Human Settlements and local authorities remains a challenge in a country that hosted the Africa Sanitation Conference in 2008 as well as the WSSD in 2002. The Department of Water and Sanitation is a regulator for both water supply and sanitation, but the Department of Health also plays an important role if there is a cholera, diarrhoea or other water-borne disease outbreak. South Africa is supposed to be leading in the implementation of IWRM processes but catchment management agencies (CMAs) are still being established; Durban will be one of many municipalities (10 districts + 1 metro) in KZN that will form part of a proposed KZN CMA. Within the Umngeni catchment area where Durban is located, two catchment management forums (CMFs) have been established by various stakeholders to represent their specific interests. In other words, an extremely complex set of governance relationships exist because the IWRM approach ultimately promotes fragmentation.

In Ghana and Malawi where IWRM has a more explicit policy presence, there is no evidence of coordinated management being a strong feature of water governance. Instead, these countries suffer a lack of coordination and duplication of efforts by various institutions responsible for water management. In Malawi, the Southern Regional Water Board (SRWB) – tasked with the provision of water supply and sanitation in urban areas

– blames the Mpira Water Authority for water rationing, claiming that it does not sell enough bulk water to them. The Mpira Water Authority criticises the SRWB for advancing commercial interests and ignoring the role of government in providing people with water. The Mpira Water Authority regards water rationing and disconnections by SRWB as part of its commercialisation strategy, and unrelated to the amount of bulk water that is being sold. The profit maximisation approach of the SRWB was responsible for disconnecting over 20 000 households within its jurisdiction in 2011. These disconnections are therefore not related to the scarcity of water as a physical resource, as SRWB argues.

In a similar context, Ghana's Water Resources Commission is not collaborating with either the Community Water and Sanitation Agency and Ghana Water Company Limited. The introduction of IWRM did not assist in promoting coordinated water management and development, but instead created competition amongst institutions. In both Ghana and Malawi, IWRM did not coordinate management and water development, but rather led to a distinct lack of coordination. Water vending in Accra – with a South African and Dutch consortium earning substantial profits – and the pit latrines that were constructed on borrowed money from the African Development Bank together resulted in both inequity and the pollution of rivers and lakes. The search for profit was externalised to both low-income society and the environment. Siltation, sedimentation, and precipitation in most water resources threaten the sustainability of the ecosystem. Discharging effluents from Kumasi ventilated pit latrines in Accra is an example of the lack of equity and sustainability of vital ecosystems.

The same is true in Malawi. For example, the provision of pit latrines in urban areas of Balaka that have operative sewer lines is an example of the acute cost-awareness of water authorities. Earlier, the Mpira water scheme provided benefits to households when it was managed solely by the Ministry of Irrigation and Water Development, but IWRM's devolution of these responsibilities to the SRWB in urban centres led to a reduction of economic and social subsidies. Once again, IWRM implementation deepened and

sharpened water and sanitation poverty in these countries (Focus Group Discussion in Densu, 2010 and Ntcheu, 2011).

In most African case studies, in part because of these governance gaps across scale, the resulting commercialisation of water has reduced access for households in rural areas. This includes half-hearted project participation. Communities in Durban, for example, participate in project structures in the form of project steering committees and Integrated Development Planning (IDP) forums. But in most instances it is only people who are active in political parties that get the opportunity to actively influence these structures. The South African government is exploring and implementing watershed management through CMAs, but bringing all municipalities, irrigation boards, and other stakeholders under one CMA may be counterproductive. There are many river basins and shared watercourses that involve South Africa, Swaziland, Lesotho, Zimbabwe, and other SADC countries. But in rivers that are not shared, the concept of river basin organisation is not strong. Household-scale water supply and sanitation priorities remain very low in CMAs.

Although Water User Associations (WUAs) were established in Ghana and Malawi in order to promote decision-making in a participatory manner, such participation was just ‘tick the box’, i.e., tokenistic in nature. The communities are part of the structures, but employees of the national ministries who are either water engineers or hydrologists are the ones who take major decisions in the name of IWRM. Members of various WUAs are not consulted when the water authorities decide to disconnect certain segments of the community and when they decide on time-tables for water rationing. When it comes to such decisions communities are voiceless customers who must either pay their bills or face disconnections. Their WUA status does not help them to influence tariff increases or gain access to water rationing time tables.

Even though the agricultural sector consumed the bulk of the water across Africa, especially where there is extensive commercial farming, consumption restrictions were mainly imposed on domestic users. In both Ghana and Malawi, water regulators have no control over commercial agriculture and industries. Once they are awarded abstraction

licenses, nobody monitors their usage and no water metering takes place since estates and industries are governed as part of private property rights. In theory they are part of the local IWRM platform, but in practice their interaction with local water authorities is confined to abstraction licensing. IWRM does not promote water and sanitation regulation but “artificial agreements” on water allocation at the local level, despite the fact that WUAs and their commercial counterparts do not enjoy the same status as water users (Focus Group Discussion held in Accra, 2010 and Lilongwe, 2012).

There is evidence of shifts in the functions of water institutions in the countries under study. In Ghana, a water company is distributing water to households and in rural areas CWSA is responsible for water and sanitation delivery. In most countries national ministries are no longer responsible for water reticulation, but there are instances where they intervene because local providers are not doing what they are supposed to. In Malawi for instance, the central state is still responsible for the distribution of chlorine to waste water treatment and purification plants. In some regions this function is performed by the Ministry of Health and not local authorities. In this instance IWRM has promoted decentralisation, i.e., the river basin as a unit of analysis, and IWRM devolves powers to the lowest level possible. But the reality on the ground necessitates de-concentration of the central state. In practice, the hydrologists and water engineers dominate the river basin authorities, and their interests in household supply are not as strong as were earlier generations of water managers who were subject to more explicit political influences (Interview with S Kumah, on 12 May 2011 and A Mabira, on 13 August 2012).

IWRM has been influential, first, in recognising water primarily as an economic good and second, in forcing the decentralisation of governance without fiscal and technical support to local levels of government. This is true not just in Africa, but across the world. There is no disagreement on the first three of the original Dublin principles within the rubric of IWRM, namely respecting the vulnerability of water, endorsing participatory approaches at all levels and foregrounding the important role played by woman as custodians of water resources, although implementation of the participatory approach and the role of women remain grey areas.

But although all principles of IWRM were considered in this study, the emphasis was on decentralisation and the recognition of water as an economic good. The professionals associated with water management within many multilateral institutions, aid agencies and African states share a perspective favourable to decentralisation and commodification. In South Africa, for example, members of the Water Sector Leadership Group are drawn from institutions such as the Water Institute of Southern Africa, the South African Local Government Association, the Development Bank of Southern Africa, the Department of Water and Sanitation, and members of the South African Water Caucus of civil society groups. Most of these institutions send representatives who are water engineers and other technical specialists. Participation by ordinary members of the public is limited.

The lack of adequate resources allocated to the decentralised structures that were created as a result of IWRM is the reason why most local authorities are still unable to implement water and sanitation projects that serve poor people. The crux of the problem is that the IWRM participatory matrix established by planners and policy makers at all levels requires resources at a local level for these projects to be realised. The establishment of water and sanitation departments is required within local and district assemblies, but national government is not willing to devolve genuine powers and adequate financial resources to this level. In Ghana, Malawi and some parts of South Africa, municipalities do not enjoy water authority status, therefore local water provision functions are performed by companies, water boards, or decentralised departments of national ministries. Durban and Accra are two of the few African cities with water and sanitation departments, environmental management departments, and energy and climate change departments. There are no environmental management and pollution control departments within local authorities in many African states, which makes it difficult for government to hold polluters accountable. The very definition of IWRM – ensuring the sustainability of vital ecosystems – is not achievable in the absence of environmental management and pollution control departments within local authorities (Aryeetey, and Ahene, 2008:340, Mkandawire, et al 2011).

Gender bias is another problem with IWRM. It is true that women play a central part in the management of water in borehole committees, water point committees, and water kiosks, but their interests are often not considered when disconnections are implemented. Women-specific issues are often not taken into consideration in many countries since there are often no indigent policies that target women-headed households which need sustainable access to water for cooking, cleaning and child-care purposes. Women play a central part in the provision, management and safeguarding of water, as reflected in the institutional arrangements proposed in the water and sanitation policies of both Ghana and Malawi (Moriarty et al, 2004:5, Maganga et al, 2002:919 and Lloyd et al, 2006:32). Yet in both countries, women carry water kilometres away from their homes, and girl children drop out of school to fetch water from boreholes and other far-away sources. Participation in tap committees and the temporary employment that women enjoyed during the construction phases of the Mpira Dam in Malawi do not automatically translate into empowerment and inclusion in decision-making and pro-women and gender mainstreaming policies. A great number of MPs in Malawi are women and many councillors elected in 2014 are women but this has not led to meaningful gender mainstreaming or decision-making by women as custodians of water and sanitation resources. Instead the gender dimension is characterised by co-optation into structures that make women powerless and more vulnerable (Focus Group Discussion in Balaka, Ntcheu and Mangochi on 12 August 2012). In sum, the implementation of IWRM has not advanced the interests of women, children and others with special needs, because the cost recovery philosophy undermines the recognition of water as a social and public good. Tariff structures are crafted in market terms and the interests of the rural poor are not adequately factored into the process (Focus Group Discussions in Densu, Mangochi and Balaka, 2010 and 2012 respectively).

Across the three case study sites, residents of communities participated in various platforms, but did not take meaningful decisions in these structures because of structural barriers associated with cost recovery and excessive decentralisation. Indeed, at the time of the field research, there were no incentives for people to participate in any of the case sites. In Malawi, for instance, when the Mpira Dam was constructed, local people were

given employment opportunities which are no longer available. In Durban, the eThekweni Municipality preferred to involve ward committees and community service agents which are part of the municipal structures, rather than respect critical voices of civil society organisations (CSOs). Ward committees are often chaired by ward councillors and members are drawn from political parties, whereas CSOs are in most cases campaigning for adequate sanitation, water rights and have specific concerns regarding water quality and broader water resource management issues. To prioritise ward committees without involving broader organisations of civil society may reduce immediate conflicts, but in the long-term is not of benefit to CMAs and CMFs. Such an orientation, according to Vandana Shiva (2002), compromises water democracy.

8.3 IWRM's contradictions in implementation

The implementation of IWRM did not adequately deal with competition amongst various users in each of the case studies. There is still duplication of efforts, and different prices charged for the same amount of water by different water institutions. There is evidence of households in Malawi choosing one provider over the other based on tariff structures. Either institutions were inappropriately configured under IWRM, the institutions themselves are rendering IWRM unworkable.

Institutional failure is common, even in the municipal water department said to be the best in Africa, Durban. As a result of duplication of efforts and inadequate institutional capacities, the local ecosystem suffers from pollution caused by upstream water users. Rural and peri-urban households face mechanical water cut-offs. Even a water reservoir situated next to Inanda SA Police Services office proved to be inadequate to cater for communities living in Matikwe, Umzinyathi and surrounding areas. The situation is similar in other African and developing countries.

The need for reliability and buffers is one of the negative impacts of IWRM, visible in Africa and elsewhere. There is no reliability of access in many countries. Water rationing is a feature in both Ghana and Malawi, where it is slowly becoming a norm that people are without access to water for months. Steps are being taken to ensure reliability of

access throughout rainy and dry seasons. Water storage facilities act as buffers in seasons with low rainfall. The focus in most countries is the prioritisation of dam construction, impoundments, and water conservation and demand management strategies. Other steps to improve access include repairs of infrastructure such as the Accra Sanitation project, and the rehabilitation of water pipes in Malawi. This arrangement is not associated with IWRM implementation in Ghana, because rationing of water access dates back to the 1970s, before IWRM was conceived. However, in Malawi, the devolution of water supply functions to water boards are threatening the reliable supply of water and destroying the buffers that MIWD had established for ecological and other purposes. The idea of an 'ecological reserve' is not popular amongst water companies and water boards who use water for trading purposes. They oppose restriction of water supply for the sake of leaving water for the sake of ecosystem balance. Changing this will require a strong regulator that will ensure that there is no over-consumption of water at the expense of the ecosystem (Focus Group Discussion at Densu, 20 May 2010 and Ntcheu, 14 August, 2012).

Attention to the social dimensions of water usage is ignored in this era of commercialisation. There is no evidence of people who were displaced and are still waiting for compensation when Malawi's Mpira Dam was constructed in 1986. In Durban, 1080 households displaced when the Inanda Dam was constructed in 1987 are still waiting for compensation. Being provided with UD toilets and grey tanks because water is scarce is regarded as an insult to both displaced communities as well as most other people in areas next to the Inanda Dam, including Ngonweni, Ngcolosi, and Umzinyathi. The commercialisation of water and lack of indigent policies in many countries including Ghana and Malawi indicate that governments are abdicating their responsibilities for providing water and sanitation as public goods. In Malawi, poor households are required to pay K4000 per month for water to the Southern Regional Water Board. There is no subsidy for poor households and the pricing is based on full cost accounting (Interviews with Teachers at Mponda Primary School in Balaka, on 12 August 2012, Mrs Kumah, Ghana Ministry of Housing, Public Works and Water on 31 October 2011).

In Ghana, Malawi and South Africa, there is a lack of reliable and sustained financing for water in the national budgets. Local authorities, schools, and other public spaces are required to pay for the water they use. In Malawi it was established that the annual budget is dependent upon donors and NGOs. Balaka District Hospital was hoping that Water Missions would assist them with water purification equipment after there was a dispute with SRWB regarding the supply of water at excessively low pressure. The implementation of IWRM is expensive for most developing countries in Africa who rely on the World Bank, the African Development Bank, and other creditors and donors for funding water resource development (Water Aid Malawi, 2005 Country Report, Focus Group Discussion held at Ntonya on 13 August 2012).

Water security remains a big challenge in most countries, particularly Ghana, Malawi and South Africa. Water in the form of lakes, rivers, and aquifers requires treatment and storage. These factors require a budget and good investments. The Durban municipality introduced dry sanitation because they claim that they cannot afford to build the additional water piping, purification and treatment plants that are required for waterborne sanitation facilities. Most countries need to decide whether developing water infrastructures for treatment, purification, and efficient use by replacing old infrastructures and water resource development functions, is more important than setting up IWRM structures.

The other characteristic of IWRM which remains problematic is the lack of improved waste management in most countries, especially in Malawi, where waste management functions are devolved to local authorities. Litter is not collected in many streets in Accra and Balaka, and this in turn has an adverse impact on water quality. In Ntcheu and Mangochi, waste removal facilities are not provided for by government. In contrast, Durban Solid Waste (DSW) performs such functions, but with uneven services in low-income areas. There is evidence of water leaks in all the projects that were under investigation (Focus Group Discussions (Densu, 20 May 2010) (Balaka, 13 August 2012) and Observations in both countries).

The sanitation project implemented in Accra faced the challenges of unaccounted-for water, due to leaks in the piping system. Most sewerage pipes required rehabilitation which was not provided for in the funding received from the AfDB. The focus of the project was meant to be on the rehabilitation of sanitation infrastructure, but in 2006 the focus shifted to the expansion of the scheme to include more beneficiaries. The project aim was to extend the existing infrastructure, but that was impossible unless backlogs were addressed. Addressing the problem of people openly defecating in Accra became more important than rehabilitation of infrastructures and the improvement of sewerage and waste removal facilities. In all of these initiatives, the Ministry of Public Works needed to play a regulatory role and the Greater Accra Municipality needed to implement the AfDB project. The realities on the ground, however, proved that IWRM implementation was undermined by the need to extend these services on an urgent basis, combined with a failure to strengthen the IWRM platforms (Interview with CWSA and Accra City Council Staff, held on 20 May 2010).

The barriers to the implementation of IWRM such as willingness to change, lack of tools and systems for integration, domination by water administration experts, and lack of quantitative knowledge about water resources, sustainability, operation, and maintenance, were also barriers experienced by most countries. For the successful implementation of IWRM, it is imperative for all stakeholders to be ready for changes in structures and systems. In most instances, stakeholders are not willing to change because there is a lack of tools and systems to enable integration. At the early stages of the South African Initiative on Dams and Development, most of the participants were water engineers responsible for designing and guiding the building of the dams while their knowledge of social issues was either minimal or non-existent.

Similarly, when UD toilets were introduced in Durban, chemical engineers interested in microbiological experiments involved their university students, who along with the influence of Bill Gates, dominated the debate at the expense of social, equity and environmental practitioners. The appointment of social facilitators contributed to the

acceptance of the UD project in some areas, although there is still resistance in some communities. But in most countries, cooperative governance is not a high priority. There are no departments or ministries dedicated to ensure harmony between the various state institutions responsible for water and sanitation, and between the state and society. Because of the lack of systems and tools for integrating governance, there is a tendency for IWRM platforms to be dominated by water administration experts and technical officials (Interview with Water Resources Board staff on 20 January 2010 and WRC staff, 15 May 2010).

There is also a lack of vital quantitative knowledge about water resources in most countries. Private sector agents and NGOs are mainly responsible for the construction of water points and water resources boards in most African countries, and because of their own decentralised operations, they are unable to account for the full spectrum of boreholes, rain-fed pumps, and water points in a given country. In Malawi, there are an estimated 750 dams, but it is not clear whether they are still in good condition because not all of them are in the hands of state.

Lack of sustainability in operation and maintenance is another feature of water resources management in most developing countries. Often the problem is funding, and it is imperative that more money be allocated in operational budgets to rehabilitate water infrastructure. Most countries, including even South Africa, have substantial operation and maintenance backlogs, including reducing water leaks, and other instances of unaccounted for water (Interview with Water Resources Board staff on 20 January 2010 and WRC staff, 15 May 2010).

Each country that implements IWRM explores various possibilities; there is no agreed-upon “best practice or benchmarks”. In South Africa, CMAs have been tested for more than ten years; originally there were meant to be nineteen but this number has since been reduced to nine. The process of integrating CMFs and Irrigation Boards into CMAs, and the involvement of local communities, both remain grey areas. The only commonalities for IWRM implementation is that first, there are no blueprints, and second, donors

become the main funders and then drivers of certain water programmes, but once they stop funding the programmes, the residual power of institutional inertia means that they continue even if they are inappropriate, and even if they are not required beyond the funding cycle of the projects. The UD programme in Durban is sponsored by the Bill and Melinda Gates Foundation, for example, and it is not clear whether harvesting of urine will still be a priority beyond the funding phase.

The IWRM's emphasis is technical rather than social which means that the political landscape and related imperatives are ignored. As a result, conducting an audit on the social impacts of large dams is unheard of in both Malawi and Ghana. The multi-stakeholder processes in large dams which were a feature after the establishment of the 1998-2001 World Commission on Dams (WCD) in most countries, disappeared after the release of the findings. In South Africa the process did not last long after the late Professor Kader Asmal – who was both chair of the WCD and Minister of Water (1994-1999) – was transferred to the Department of Education (1999-2004). There are to date no further follow-up initiatives, and indeed the South African government was subsequently part of a backlash *against* the WCD (Interview with Central Water Board staff, 20 June 2011 and an employee of GWCL on 17 June 2010 respectively). In short, the unintended consequences of IWRM's institutional and socio-political aspects often emerge, at the peril of those who believe the approach is politically neutral and technicist.

8.4 Manufactured water scarcity in Africa

Water scarcity is generally not a physical but instead an economic problem. Although in 2014 the northern area of eThekweni began suffering from physical water shortages as a result of extremely high growth rates in wealthy new suburban enclaves that outstripped physical supply during a period of low rain, in Ghana and Malawi there is no evidence of a lack of water as a physical resource. There is, however, evidence of recent institutional mechanisms that are not working in favour of water access for certain segments of the population. In each of the cases under consideration, poor rural and peri-urban households are systematically excluded from gaining access to water and adequate sanitation.

In Durban, the sanitation system adopted, simply assumed that poor people would never be able to afford flush toilets. The CWSA in Ghana excludes rural households from accessing water and sanitation through up-front payments of 5% of the installation fees. Rural households unable to pay this amount are excluded as beneficiaries. In Malawi, a similar type of contribution is required prior to the establishment of a borehole. Rural households are therefore excluded by market forces and not through lack of water as a physical resource. Both countries are anticipated to be “water stressed” but they are not yet at the stage of experiencing “water scarcity”. South Africa is already experiencing water scarcity in some areas, and this is still used as justification for the provision of UD toilets in the rural areas around Durban. Such scarcity is manufactured by donor and multilateral institutions, aided and abetted by local African officials, to justify charging the poor high prices and, in the process, subsidising the hedonistic lifestyles of the middle class and the rich (Focus Group Discussion notes taken on 25 May 2010, Densu and 14 August 2012, Balaka).

There are also shortcomings in IWRM implementation that create bulk water system scarcity. In all the case study sites, priority needs are not only retail access by households, but also the operation and maintenance of waste water treatment plants, and sewerage and storm water infrastructures. Two related challenges are preventing river pollution and bringing ordinary people into discussions on water allocations through WUAs. This is especially vital as manufacturing water scarcity affects society, when the rationing of water and disconnections are under discussion. The solutions that can be identified by communities – such as halting water leaks – are too often ignored by state actors as a result of inadequate consultation.

In South Africa, irrigation boards and WUAs are responsible for collecting water tariffs, installing meters and enforcing pollution controls from commercial farmers, a responsibility which the Department of Water and Sanitation failed to fulfil in the past 20 years of democratic rule. In one interesting counter-example, cooperatives in Mpumalanga Township, in the Durban West region, are responsible for the rehabilitation of wetlands and rivers, and in another, communities living on the bank of Piesang River,

in Ntuzuma continuously rebuild houses destroyed by floods. In Malawi, members of the tap committees collect operation and maintenance fees from households. In most of the above examples, even though they lack resources, some communities appear to be more effective than government institutions in advancing collective actions.

The scarcity of water is not subject to the production possibility curve in a neo-classical economics framework. But the exclusion of the poor in decision making has meant vast increases in prices and lowering of supply standards for the poor. This class discrimination is part of the artificial manufacture of water scarcity. Water is more expensive in rural Ghana compared to urban areas served through GWCL connections and to water kiosks, and in Malawi, where the water served by Mpira Water Authority is cheaper compared to the SRWB (Focus Group Discussion, 25 May 2010, Densu and 14 August 2012, Balaka). In most countries there is an abundance of water in the form of lakes, rivers, dams, and aquifers. What is lacking in overcoming this artificial scarcity is both funding and the involvement of poor people in decision-making processes that can address affordability in a structured way, with appropriate access to needed subsidies.

In Ghana, for example, as stated in chapter five, it was observed that because of system breakdown, Ghanaian water scarcity was manufactured. Where they exist, water mains and drainage systems are poorly maintained which often results in flooding. Most households in the Greater Accra Metropolitan Council are served with KVIP latrines, flush toilets with full pressure systems, and septic tanks. The use of pan and KVIP latrines are the result of weak sewerage disposal systems and low levels of waterborne sanitation.

In Malawi, as chapter six showed, there is an abundance of water in Lakes Malawi, Chilwa, Malombe, and Chiuta yet also high levels of pollution and dilapidated infrastructure. This created a reliance upon donors for water supply projects. In spite of 17 water resource areas and 78 water resource units, Malawi faces an ongoing lack of CMA capacity to manage water resources. Water systems cover only 21% of the country, and to improve this requires budgets to develop piping and sewerage facilities. The Mpira

Balaka water schemes are located in an area that is rich in water resources; but the inappropriate water resources management associated with IWRM implementation created a perception that the country faces scarcity.

Due to affordability constraints that are accepted not challenged within IWRM, most of the rural areas apart from commercial farms are served only with unimproved and VIP pit latrines, while drainage facilities are non-existent, thus compromising the water quality in Lake Malawi due to latrine effluent discharges. In Durban, a similar failure to address affordability with appropriate subsidies led to a sanitation system that the head of the municipal water services acknowledged in 2014, was seen as ‘discriminatory’.

8.5 IWRM as a catalyst for rural water and sanitation poverty in Africa

8.5.1 Water as an economic good in decentralised state institutions

It was established in this study that decentralisation and the recognition of water as an economic good as contested principles of IWRM, are contributing towards the failure of various countries to manage their water, earth, and related resources in a coordinated manner. It was further established that rural households in Africa do not enjoy the social and economic benefits associated with the introduction of IWRM in their respective countries. Instead, they are subjected to manufactured water and sanitation scarcity designed to promote inequitable distribution, skewed in favour of wealthier classes and urban residents. While IWRM’s lack of sustainability has been observed by numerous scholars (GWP, 2000, de Moran and Balestero, 2003:5, Biswas, 2008:7, Sanavanan, et al., 2008:5, Muktarov, 2009:1, Lloyd, et al, 2006:13), there are several unique features of this research which contribute to knowledge about IWRM. The study tested the characteristics, reasons for IWRM implementation, principles of IWRM, impacts, benefits, barriers, implications, and what needs to be done to make IWRM work in real life situations in Ghana, Malawi, and South Africa. The conclusions drawn are that most countries are not ready in terms of institutions, policies, legislation and capacity building. The factors that drive the implementation of IWRM in these countries are external and

donor-driven; access to water and sanitation in most countries, including these three, therefore remains a pipe dream in a context of manufactured scarcity.

8.5.2 IWRM fault lines in Ghana, Malawi and South Africa

Some scholars (van Hofwegen and Jaspers, 1999, Moriarty et al, 2004: 6) define IWRM as the assignment of functions to water systems, the setting of norms, enforcement (policing), and management. The assignment of explicit IWRM functions to various water resources management institutions is well articulated on paper in most countries, but most of the institutions this research has explored neither perform the functions nor set any norms. The argument here is that IWRM has been faulty from its very conceptualisation in Dublin and at the conferences that took place before and after its adoption. Local authorities and other state institutions also do not enforce water and sanitation laws or perform any water resource management functions.

In Ghana, for example, district assemblies are expected to coordinate and facilitate access to water and sanitation in the areas where they have legislative and administrative powers. This also remains a wish-list since local authorities do not have planning departments, budgets, water, sanitation departments, and the staff who would ideally be responsible for discharging such responsibilities. A similar situation is found in Malawi where local assemblies are expected to perform water and sanitation functions, but none of them have water and sanitation departments, town planning departments, budget, and staff to initiate projects at a local government level. Local stakeholders in an IWRM platform in Malawi are coordinated by the Mpira Water Authority which is a regional office of the Water Resources Board of the Ministry of Irrigation and Water Development (MIWD). Enforcing water and sanitation laws and regulating standards on the construction of boreholes remain the function of the WRB located within the MIWD. On paper local assemblies are responsible for coordinating access to water and sanitation services within their jurisdiction, but in practice such functions are still performed by either the Mpira Water Authority or a water board. In Durban, the eThekweni municipality is well staffed, but the character of the department's officials led to class discrimination policies.

Donors such as the AfDB have prescribed IWRM, and various countries are complying with the prescriptions by putting on paper what their funders want while in practice they simply continue with what they can actually afford to do. The Local Government Act, 462 of 1993 was promulgated in Ghana and the Local Government Act of 1998 was promulgated in Malawi, and both countries are expected to support decentralisation. In both countries, however, local government institutions that have powers and resources to discharge local government functions, are still in foundational stages. It is perhaps important to broaden the local scale to include watershed management, as is being explored in South Africa in the form of CMAs.

South Africa, Ghana, and Malawi have water and sanitation policies that outline the roles and functions of various stakeholders operating within IWRM frameworks, but global standards of adequate sanitation and water remains difficult to implement despite some countries having “customer service charters” and “service level standards”. In 2008 the Ghana Supreme Court ordered the Accra Metropolitan Assembly (AMA) to phase out about 5200 pan and bucket latrines and instead provide 1500 water closets and KVIPs which were only constructed in 2010. The AMA was also ordered to subsidise the households that converted their buckets and pan latrines into water closets and KVIPs. This ruling was the first attempt to elaborate on the functions and responsibilities of the AMA within an IWRM framework. This was also the first attempt to enforce sanitation rights enshrined in the Ghana Constitution. However, the norms remain those set by donors regarding community management, and community contributions are expected to help finance installation, operation, and maintenance.

The failure of authorities in Ghana and Malawi to develop water and sanitation strategies with clear norms and standards render this aspect of IWRM irrelevant. Aside from housing-related sanitation (i.e., during construction financed from national level), both South Africa and Ghana have devolved explicit sanitation upgrading responsibilities to local authorities, and the national governments regulate implementation. This approach will potentially be adopted by all African states as per the 2008 eThekweni Africa

Sanitation Conference Declaration, but implementation may be delayed until all local authorities are fully capacitated to discharge such responsibilities.

Other scholars (Calder, 1999, Moriarty, et al, 2004:6) outline IWRM as involving the coordinated planning and management of land, water, and other environmental resources for equitable, efficient, and sustainable use. It is an indictment that the local governments in Malawi and Ghana lack coordinated planning. Integrated development plans or equivalent documents are non-existent and planning takes place in a very haphazard manner. Water users, as described in each country's water and sanitation policies, are meant to provide inputs to planning documents. In South Africa, Integrated Development Plans (IDPs) and Water and Sanitation Development Plans are linked to land use management and other environmental resources. However, community stakeholders are marginalised in IDP, budgetary, and planning processes, which is why most of them continuously protest against poor service delivery (WRC Citizen Regulation Project Report:2014).

In Malawi, the Ministry of Environmental Affairs is responsible for the State of the Environment Report, which covers rivers, aquifers, wetlands, and flood plains. It is common to find incidences of cholera outbreak in cities such as Zomba and Blantyre, caused by poor sanitation facilities (Interview with officials from Balaka District Hospital, August 15, 2012). In most countries, there is a common problem of discharged effluents from toilets to rivers and oceans (where beaches are despoiled). Poor management of waste water treatment plants, building houses in flood plains, acting on the findings of the state of rivers and environmental reports, publication of climate change adaptations, and mitigation plans remain challenges in local authorities. None of the local authorities have functional environmental and water departments which impedes local participation in environmental impact assessments. All of these deficiencies in the implementation of IWRM are based on the fact that the AfDB-sponsored IWRM implementation in Africa promotes mismanagement of water resources, poor environmental management and pollution control, poor water and sanitation regulation,

and inequitable, unsustainable, and inefficient distribution of water and sanitation services to poor households in rural areas.

Water demand management, water restrictions, and water conservation all target poor households in most African countries. Excessive water users (water withdrawals) in commercial agriculture, mining, and industrial sectors do not face water rationing since they manage their own water resources and do not depend on water authorities. In some cases, they have political clout that reflects their economic power. They abstract water from dams and impoundments, in some instances without licenses granted by WRB, DWA, or WRC in Malawi, South Africa, and Ghana. Low income households in rural areas are subjected to water restrictions, cut-offs, and rationing while their urban counterparts, and even larger-scale users in commercial agriculture, mining and industrial sectors, enjoy unrestricted access to water their English gardens, swimming pools, and plantations, and in turn to discharge effluents into rivers and lagoons. Water points, boreholes and sanitation facilities are continuously broken because the households themselves are expected to operate and maintain these facilities without any assistance from the state. Access to water and sanitation facilities in schools situated in low-income areas is often reduced to unimproved pit latrines and boreholes, while industries, mines, commercial agriculture, and formal suburbs enjoy flush toilets and metered water access. Even in Durban, the municipality is exploring the imposition of water restrictions as a demand management tool. This may be difficult to implement in industries and commercial agriculture because their licensing is dealt with by the national government. The problem of water withdrawals and the institution of water demand management is only faced by households; other water users are not subjected to such restrictions.

Most of these problems could be surfaced, if not solved, were more grassroots activists and citizens' groups involved in water policy-making and implementation. Saravanan et al (2008:11) are of the view that IWRM promotes participatory decision-making. Structures and institutions such as WUAs and WATSAN committees, CMAs and forums, citizen action groups, NGOs, and tap and borehole committees are established in most countries as a requirement to implement IWRM. In most instances, as seen in the case

studies of Ghana and Malawi, none of these structures are consulted by water boards, water companies, or regulatory bodies in tariff formulations and increases. In Durban, the process was also unsatisfactory, according to interviewees, taking the form of a partial *instruction* (usually via politically-biased Ward Committees) with no options for alternative arrangements, instead of genuine consultation about project design and implementation. None of these institutions of popular participation are consulted when water authorities embark on water rationing, restrictions, and disconnections. Water demand management is meant to benefit all stakeholders, but the above institutions are not consulted, and the major users of water are often able to avoid rationing. Moreover, when governments consult with their citizenries on Poverty Reduction Strategy Papers through Bretton Woods Institution processes, the water-related institutions of civil society are normally not invited to participate.

This problem has long been noted in the water sector. During consultations of the 1998-2001 World Commission on Dams in various countries, communities were generally not consulted and therefore did not form part of the decision-making on matters which affected them. Dam-affected communities in Durban led by the Qadi people protested against the hosting of the Dusi canoe marathon at the Inanda Dam before their reparations were paid, in spite of facing a banning order from the City Manager (Notes from an interview with O'Brian Gcabashe, a survivor of Inanda Dam displaced communities on 15 December 2013). Although eThekweni Water and Sanitation did change its Free Basic Water policy to provide 9 kiloliters per household per month in the wake of civil society advocacy, the standard procedure associated with the cost recovery and decentralisation strategies is to impose these upon the 'beneficiaries'.

IWRM is meant to be characterised by a systematic process that attempts to work within a framework of the whole hydrological cycle, integrating the needs of downstream as well as upstream users (Saravanan, et al, 2008:10, McDonnell, 2008:133, Moriarty, et al, 2004:7). Water comes from catchment areas and flows from springs and streams into rivers, and thereafter is stored in dams, treated and purified before being reticulated to domestic users. In the disposal process, grey water is returned to treatment facilities for

recycling, and water for the environmental restoration is protected for use in wetlands, aquifers and groundwater. Practically speaking, though, this systematic process is broken when wetlands are polluted through the discharge of effluents from mines, agriculture, industries, ships, and toilets. Communities that are displaced when dams are constructed normally do not get access to the water and sanitation they sacrifice their livelihoods for. While most municipalities fail to regulate industrial, mining, navigational, and agricultural users, water for the environment and for domestic use is in most instances compromised by pollution and over-consumption. Rural households that do not have money to pay for either water or sanitation services are likely to have their interests ignored in this highly contested hydrological cycle. Indeed, as the case of Durban reveals, a formal 'sanitation belt' can geographically cement in this anti-rural segregation in state service delivery, against the interests of poor people.

In short, power relations which work in favour of the rich and powerful sections of the community and are skewed against the rural poor, offset the systematic process of integrating water and sanitation in a holistic way, as IWRM rhetoric claims is necessary. IWRM's internal logic – especially cost recovery and decentralisation of responsibilities without adequate resources – confirms the tendency to amplify existing power relations, with all that this implies in geographical terms. The poor, who live mainly in downstream areas, are subjected to drinking polluted water from boreholes and other ground water sources while their upstream counterparts continue to enjoy purified and treated water.

These are contradictions that appear to be ingrained within IWRM. According to the proponents of IWRM (Guerquin et al, 2003:29, Lloyd et al, 2006:35, McDonnell, 2008:135, Moriarty, et al, 2004:8), the implementation of IWRM requires reform of water and sanitation institutions, the adoption of 'demand responsive' approaches which involve users in operation and maintenance (though this may also be a code-phrase for market-led systems), the devolution of service provision to private autonomous and accountable institutions, the establishment of frameworks for efficient conservation and trans-boundary management of water resources, and decentralisation of management structures. Reforms took place in Malawi, South Africa, and Ghana at the time that most

African countries adopted IWRM efficiency plans. In Malawi district coordination teams, village action plans, and village development committees were established, and district water officers appointed together with district environmental officers. But the district water development officer reports to the permanent secretary of the MIWD and not to the district commissioner or district assembly, as IWRM and legislation require. Even the district development fund is misused by members of parliament to solicit party political patronage. In short, the IWRM approach is sabotaged in the *realpolitik* of what Mahmood Mamdani (1996) has identified as ‘decentralized despotism.’

Demand responsive and water conservation approaches target the poor and rural households as indicated above. Involving users in operation and maintenance, as prescribed by donors active in Ghana, became an excuse for the government to abdicate its responsibility to provide services to poor rural households. The establishment of the Ghana Water Company Limited, the privatisation of water, the establishment of autonomous regulatory institutions such as the WRC and EPA, the separation of urban from rural water supply symbolised by the creation of CWSA, and the devolution of rural sanitation to district assemblies, are all examples of reforms introduced in Ghana when the country adopted IWRM. These reforms are responsible for the poor regulation of water resource management, the lack of subsidisation to poor households (especially those in rural areas), and government abdicating its constitutional obligations to provide the water and sanitation services that are recognised as fundamental human rights. The fact that households in Durban are expected to operate and maintain their pit latrines while neighbours who were served with VIP and septic tanks are getting “free” emptying services from government, justified the complaints that the UD roll-out was characterised by lack of equity, poor communication, and a lack of responsiveness to local issues (notes from an interview with Induna Ngcobo from Ngonweni on 20 August 2011). The 2014 adjustment of that policy, so as to begin a process of government-supported UD container emptying, only serves to show that it takes civil society advocacy to begin a process of sanitation rights restoration. But the very location of the UDs on the peri-urban and rural periphery continues to confirm that class segregation is a logical outcome of the IWRM emphasis on cost recovery.

If the implementation of IWRM means “things fall apart” (as Chinua Achebe put it), why does the approach retain its influence? Why is a strategy long-regarded as techno-centric, based on a linear model of water resource management, and very thin on local knowledge, still dominant? (Biswas, 2008, Saravanan et al, 2008:4, McDonnell, 2008:141). The answer is because institutions such as UN-Habitat, UN Water, ECA, the AfDB, the World Bank, DFID, SADC, ECOWAS, Africa Water Facility, and the World Water Council view IWRM as a solution to water-related climate change, drought, unsustainable sharing of water courses, decreasing world fresh water sources and inadequate subsidisation of household water and sanitation supply. The above-mentioned donors and regional trading blocs view IWRM as a saviour when it comes to pollution of water sources, population increase, prevalence of water-borne diseases, un-accounted for water, water withdrawals, and the global water crisis that impacts negatively on rural African citizens, in part because it shrinks state responsibilities and compels poor people to expect much lower levels of service provision than are available to their urban, higher-income fellow citizens.

The remedies prescribed by most of the above donors are: adoption of water efficiency plans, the implementation of water and sanitation policies, the establishment of river basin organisations, participation of the private sector devolution of national government management to the lowest level possible, community payments for installation, locally-organised operation and maintenance of water points, the separation of water from sanitation institutions, and the separation of rural service providers from their urban counterparts, all paid for as much as possible by recipients. However, none of the above IWRM interventions addresses climate change, cooperation at basin level, the reduction of water-borne diseases, the discharge of effluents in rivers and aquifers, water wastage, withdrawals, and drought. Even the building of large dams to store water during dry seasons has social, environmental, and economic impacts. Furthermore, the emphasis on cost recovery is a recipe for social conflict and system break-down, with resulting gender and public health impacts. The geographical segregation that IWRM often explicitly promotes, will be devastating for future generations.

The solution to these challenges is building the capacity of local authorities to manage water resources effectively, and reorienting national and global budgets (and policies) to support appropriate subsidisation. In most instances, local authorities purchase bulk water from water utilities, and this should be one basis for redistributive pricing. However, neither the Balaka Local Assembly in Malawi nor the AMA in Ghana has any authority over the Mpira or Akosombo dams, respectively. Neither have jurisdiction over commercial agriculture or industries that waste water. They have no control over GWCL or SRWB water infrastructures which are dilapidated and which leak over 50% of the water. They have no control over water withdrawals in the agricultural sector. Commerce, agriculture, and industry abstract water directly from rivers, construct their own waste water treatment plants, and construct and manage their own irrigation and drinking water dams. Without the capacity to hold polluters accountable, the application of water restrictions in sectors that over-exploit water resources and the management of water at the lowest possible level, remain IWRM fantasies. The politics of water in Ghana, Malawi and South Africa show that IWRM's ostensibly rational approach is easily undermined by those with class, gender and race power.

What the case studies demonstrate is how uneven the IWRM approach is, in practice, when tackling its objectives. These include the promotion of integration of soil, vegetation, beneficiary participation, water conservation, pollution control, increased potable water supply, sewerage disposal management, improving waste water treatment, and balancing domestic consumption and irrigation (Lloyd et al, 2006:34, Moriarty et al, 2004:10, Inter-American Development Bank, 2006). Results discussed in Chapters 5, 6 and 7 confirm that these objectives remain pressing challenges, even after many years of IWRM implementation. Instead of improvements, the situation in some sectors is becoming more challenging every day, with WWTPs managed by the private sector in Accra being the only ones that are functional, for example. At some point (2011), only 11 out of 29 WWTPs in Durban were operational and Green Drop certified, and Durban lost its international tourist-recognised Blue Flag status due to its polluted beaches, as plumes of E.coli led to higher-than-acceptable levels on some of the country's most popular

beaches. Decentralisation and management of water as an economic good have the potential to worsen pollution, unaccounted for water, wastage, and the discharge of sewage effluent into rivers and lagoons. Furthermore, the siltation and sedimentation of dams remain remnants of mal-governance and mal-administration associated with IWRM implementation.

When tracing the original Dublin principles, there is no debate about the importance of water as a catalyst for the sustenance of human life (people depend on water for their livelihood). The IWRM vision to protect the natural ecosystem, and the importance of promoting land use management within the catchment are also beyond reproach. But the contested terrain in IWRM implementation is the role of the state, especially central government. It is here that the policies, budgets, institutions and managerial systems are established. The theoretical standpoints of water governance, NIE and ecological economics all put enormous stress on the ability of a central state to regulate, construct and run water systems.

But a much less ambitious approach is adopted by IWRM advocates. As early as 1992, promoters of IWRM who met at Dublin were calling for central government to merely facilitate and implement sector leadership, coordinate the development and transfer of skills, and provide technical advice and financial support to local groups, instead of handling the hydrological system with the national-scale power and fiscal capacity that it actually requires (Moriarty, et al, 2004:5, Maganga, et al, 2002:919, Lloyd et al, 2006:32). As a result of inappropriate decentralisation and the excessive commodification of water, IWRM implementation has remained a challenge from the outset. Most developing countries including South Africa, Ghana, and Malawi used the Dublin principles to drive reforms in the water supply and sanitation sectors. Ghana separated urban from rural water supply when GWCL and CWSA were created. The Ministry of Housing and Water Development in Ghana, the Ministry of Irrigation and Water Development in Malawi, and the Department of Water and Sanitation of South Africa have become sector leaders but they each shifted their focus from implementation to facilitation. Local and district assemblies in Ghana and Malawi and municipalities in

South Africa became implementers under decentralised water supply and sanitation delivery models.

In most countries the transfer of skills was expected to happen automatically once IWRM was adopted as a policy, so technical and financial support from the central state was not a priority. Yet still today, Malawi lacks experience in local government and to date members of parliament are still debating borehole provision in the legislature instead of water and sanitation policies. As members of district coordinating committees, MPs find themselves part of both legislative and executive authority, which is why boreholes and water-points are debated in parliament not as part of the reports from MIWD or the Ministry of Local Government, but as part of the duties of MPs in their respective constituencies. The capacity of local groups in the form of CMAs, CMFs, WATSAN committees, WUAs, and local authorities are limited. Their ability to handle budgeting, water resources development, pollution control, and climate protection remain merely visions in policy documents; action plans are forever postponed. As one reflection of the gap between IWRM policy and reality, in Durban, the councillors who adopted UD toilet approach distanced themselves from the roll-out when various communities started to protest (notes from an interview with Councillor Bhengu on 20 August 2011).

Even central governments in Africa still need capacity in most of these functions; trying to undertake the role of facilitator under the rubric of IWRM which took place too soon. The inter-departmental collaboration and bottom-up processes envisaged in the water and sanitation policies of Ghana and Malawi are thin on practical implementation. Inter-departmental collaboration is visible at national level, but not traceable at local level. Some national government departments are not participating in local IWRM platforms, but are expected to collaborate at local levels in the same manner as they do at national level. The same unevenness exists in state-society relations. For example, various meetings that former South African water ministers Ronnie Kasrils and Buyelwa Sonjica once convened with the South African Water Caucus did not materialise in any substantive change after they left office. Water and sanitation-related protests have since

become very common in South Africa (notes taken at the meeting of the South African Water Caucus on 20 November 2013).

There is also no debate about a participatory approach in water development and management involving users, planners, and policy-makers at all levels. The need for decisions to be taken at the lowest appropriate level, with full public consultation and the involvement of users in the planning and implementation of water as postulated by Biswas (2008:20), Butterworth and Batchelor (2004:5), Maganga, et al, 2002:919, and Lloyd, et al (2006:32), is also not debatable. The gap lies in the operationalization of this IWRM principle. Structures and processes such as WUAs, WATSAN, tap committees, borehole committees, PSC, ward committees, CMFs, EIAs, and SEIAs are in place, but communities in most countries sporadically get water and sanitation bills, do not participate in tariff formulation, and remain spectators in their own development. The fact that the government does not consult households on water rationing, water cut-offs, and that there are no public participation processes involving regulators such as WRB, WRC, PURC, SRWB, communities, and water authorities, points to the fact that participation remains written in policy documents, but is not visible in action.

The last IWRM principle agreed upon at Dublin in 1992 is the recognition of water as an economic good. After civil society resistance at the second World Water Forum in the Hague in 2000, subsequent modifications of commodified water included acknowledgements of the fundamental right to this resource and attention to affordability. But in practice, the formula of commodification plus rights and affordability rhetoric remains controversial in the case study sites as well as the rest of the developing world. The economic value of water is recognised through the conservation and protection of water resources to achieve efficient and equitable use, but the full costing of water and ‘getting the prices right’ for the poor, as advocated by the Africa Water Facility of AMCOW located within the AfDB, remain controversial strategies within IWRM (Jayyousi, 2007:329, Moriarty, 2003:84, Moriarty et al, 2004:5, Maganga et al, 2002:919, Lloyd, et al, 2006:32 and Rogers et al, 2002:1).

Even demand management and water conservation target rural households in Africa. Charging higher prices to poor households as advocated by the AWF, the AfDB and AMCOW, has proved to be a distortion of IWRM by petit-bourgeois bureaucrats in these institutions. The failure of communities in both Ghana and Malawi to contribute 5% towards the installation, operation, and maintenance fees and the failure of most local and district assemblies to achieve this contribution in their areas of operation, is proof that IWRM needs to be rethought on the economic front. It remains a myth that the poor are willing and capable of paying for water and sanitation services if the prices are set correctly (meaning, in AWF language, as high as possible).

To illustrate, low-income households in Malawi have opted for water supply services provided by the Mpira Water Authority instead of commercialised and expensive tap water provided by SRWB (Focus Group Discussions at Ntonya Village, Balaka on 14 August 2012). Even public hospitals (such as the Balaka District Hospital in Malawi) prefer the Mpira Water Authority over the SRWB, which is a decentralised water board, because of the SRWB's overpricing and poor service provision. In Ghana, households forced to purchase from vendors who double and triple the price of water prefer institutions such as GWCL and CWSA because their rates are reasonable. Researchers are still looking for the 'poor' which the AWF identified as willing to pay for water and sanitation even if prices are kept high. The rural poor in Ghana and Malawi are prepared to buy water from central government, but prices include the subsidy in line with the recognition of water as a public good.

As for the impacts of IWRM, problems include inappropriate competition among water and sanitation institutions, pollution, lack of reliability and buffers, lack of attention to social dimensions, and lack of reliable and sustained financing in water management (Brischweiler, 2003:7, Pahl-Wostl et al, 2011, Lloyd et al, 2006:49, Moriarty et al, 2004:15, Maganga et al, 2002:924, Guerquin et al, 2003:30, Brown and Clarke, 2007, Clement et al, 2000:3). Various institutions responsible for water resource management, and water supply and sanitation compete with one another instead of collaborating. There are instances of SRWB competing with the Mpira Water Authority in Malawi. The role

of the WRC and other commissions such as forest and mining, remain contradictory. It is not clear who is responsible for the regulation of water and pollution problems in the mining and forest sectors in Ghana. The EPA performs regulatory functions which are also performed by the WRC.

In neither Ghana nor Malawi do water resource strategies make provision for ecological reserves. Nor are there adequate safeguards for uninterrupted supply and buffers. Ecological reserves form part of the National Water Act of South Africa, but discharging effluents from toilets in various water sources is common, and make a mockery of the legal water reserve obligation. There are also conflicts between the allocation of domestic water supply and other sectors which results in domestic restrictions and rationing, whilst other sectors enjoy uninterrupted supply. Social impact assessments are a requirement in AfDB and World Bank funded projects, but the promotion of equitable access, the enhanced role of women, employment and income implications (Brunschweiler, 2003:5, Clement et al, 2000:3), are ignored in the implementation of IWRM projects. The water and sanitation budgets of both Ghana and Malawi are funded by donors; there is no clear and long-term commitment from government to provide financial and human resources support (Brown and Clarke, 2007). Rural communities are expected to manage water and sanitation schemes as part of community management required by donors.

There are supposed to be benefits from IWRM, including water security, efficient water use, improved waste management, participation and gender equity. But in the three case studies, these benefits are as elusive as they appear to be in most developing countries, as confirmed by Moriarty, (2003:91), Moriarty et al, (2004:21), Bruschweiler, (2003:7), Pahl-Wostl et al, (2011), Moriarty, et al, (2004:19) and Visscher et al, (1999:50). Households in Ghana wait days and often weeks to access water, indicating a lack of water security for low-income people which results in increased pollution costs and increased conflicts amongst users. The demand management strategies that target poor rural households in Ghana and Malawi result in inefficiencies, for the industrial, agricultural, mining, and forestry sectors remain wasteful. Yet low-income rural domestic users are the only sub-sector exposed to water rationing and restrictions. Water losses

estimated at above 50% due to dilapidated water infrastructures remain a challenge in developing countries. IWRM is supposed to contribute towards the improvement of waste management practices (Pahl-Wostl et al, 2011), but experiences in Accra prove that even the establishment of a waste management department is not a solution to waste disposal, and that effluents from waste water treatment plants are still discharged into water resources. There are no waste disposal facilities in Malawi, especially in Balaka, where rubbish is visible on the railway line and even close to the offices of the Mpira Water Authority in town. There is no solid waste disposal department in the Balaka local assembly.

Proponents of IWRM argue that if barriers to the implementation of IWRM are removed, water governance can improve. Water and sanitation stakeholders are expected to embrace change and thus deal with a lack of willingness to change which is often experienced when various sectors are expected to cooperate. IWRM was meant to provide water professionals with tools and systems for integration in order to ensure that water governance is effective. Effective water governance is often hindered by the domination of water administration by water experts and a lack of quantitative knowledge on water resources. Lack of sustainability, operation and maintenance are also barriers to the implementation of IWRM (Bruschweiler, 2003:6, Lloyd et al, 2006:50, Pahl-Wostl et al, 2011, Slootweg, 2009:4, Oda, 2003:37, Clement et al, 2000:6). Experience in the field proves that water resources development and water supply and sanitation are hosted in various ministries in Ghana and Malawi. Rural areas are artificially separated from urban water, or in Durban's case, the peri-urban is demarcated as outside a 'sanitation belt'. Sanitation and hygiene promotion are in Ghana and Malawi located in the ministries responsible for health and local assemblies, so instead of IWRM's desired integration, the result is fragmentation.

Likewise in the case study areas, water resource development is located in different institutions and therefore tools for integration are often not considered. IWRM platforms involving various stakeholders are usually affected by lack of deployment of suitably qualified employees at local government level, and by conflicts between the central and

the decentralised state organs. Even where local participation is encouraged, it is often perceived as tokenistic participation whereby local stakeholders are often co-opted into government processes.

Local authorities are regulated by central governments which lack blueprints to implement IWRM. The results include water policies and projects that are fragmented and that fail to comprehensively deal with the multi-functionality of water from biophysical, socio-economic, and institutional systems perspectives (Pahl-Wostl et al, 2011, Lloyd et al, 2006:53 and Slootweg, 2009:4). IWRM implementation is dominated by water engineers and other technical staff; social scientists do not normally form part of water and sanitation administrations. Communities in rural areas lack quantitative knowledge on water resources yet are expected to operate and maintain water and sanitation projects. System breakdowns are common in Ghana, Malawi, and South Africa. The WRB (a regulator in water resource development) lacks knowledge about the exact number of boreholes in Malawi, and some remain in government statistics lists when they are no longer in use, due to poor maintenance. In Ghana WWTPs are so poorly managed that all five-state owned facilities in Accra are dysfunctional, and only four out of thirty five privately owned facilities are functional. In South Africa, water reservoirs in some parts of Durban are dysfunctional, hence local communities are sometimes without water supply for six months at a time, for example (since December 2013) in Matikwe and Umzinyathi in the immediate vicinity of the Inanda Dam.

As a result of all these problems in IWRM, the benefits of the approach remain elusive in Ghana and Malawi. Adverse aspects of IWRM we have identified in the three cases include the shift of government to facilitator and regulator, the inadequate level of government support and excessive private-sector, for-profit involvement, institutional changes, the establishment of river basin organisations, and the setting of hydrological boundaries such as catchments as postulated by Clement et al, (2000:7), Lloyd et al, (2006:34), Jayyousi (2007:336), Pahl-Wostl et al (2011) Dauda (2006:291) and Oda (2003:39).

The overall conclusion is that IWRM implementation in these three cases has brought about a shift in policy and government, scaled up the abdication of constitutional obligations to provide water and sanitation services, and scaled up private sector participation and community management at the expense of providing adequate subsidies to poor households. As much as governments have become facilitators and regulators, and as much as the private sector and low-income communities have had to become implementers, the availability of access to water and sanitation by poor rural households has diminished instead of increased.

8.5.3 Water resources struggles, from scarcity to abundance

Many of the concerns raised above, drawn from the case studies, confirm the insights of governance, NIE and ecological economics theories. There, as we saw in chapter 3, the tendencies to excessive decentralisation and to water commodification embody extremely important contradictions which have made IWRM an extremely challenging approach for the water sector. What, though, of the various institutions established to manage water resources and provide water supply and sanitation services?

Ghana and Malawi have complied with the contractual obligations of the AfDB in terms of setting up institutional forms of management that separate rural water and sanitation as systems that differ between rural and urban areas. In the process, Ghana and Malawi reduced and eventually abolished subsidisation of rural water and sanitation services, which in turn led to institutional decay. In Ghana and Malawi, institutional decentralisation took place without any planning; municipal governments which became responsible for water supply and sanitation were not ready to discharge such responsibilities. The institutional arrangements brought about through IWRM left rural households with the burden to operate and maintain their own water resources. But they were unable to pay for commercialised services in areas where water boards and vendors are operators. Long queues of people wait for water in Ghana because they are unable to pay for expensive services rendered by vendors. This is just one more example of the manufactured water scarcity that most rural Africans are faced with in their daily lives.

In terms of resistance, households and state institutions that reject the commercialisation of water and sanitation services have taken various forms of collective action. For example, opposition politicians and lawyers took the AMA to the Ghana High Court and demanded the eradication of pan and bucket latrines. Health institutions in Malawi resorted to changing their service provider from the commercialised water board to a national operator (the Mpira Water Authority). Vandana Shiva (2002) is of the view that the active participation of CSOs in water governance can contribute to strengthening water democracy. Proponents of IWRM are still hoping that it will be implemented according to the blueprints of commercialisation, decentralisation, community management and privatisation. However, opponents are already embarking on collective action to prove that Africa's water and sanitation scarcity perpetuated by IWRM cannot be tolerated. It can also be concluded that IWRM implementation in Ghana and Malawi lacked consideration of local dynamics. Even if there are attempts to deal with all of the above, IWRM implementation remains flawed in the very principles that have shaped its creation.

The three case study sites also allow us to conclude that water scarcity is manufactured through institutional mechanisms that favour community management in rural areas and private property rights in affluent areas. In the former, capital and operational costs are borne by rural households at the invitation of the private sector. Decentralisation policies meant district and local assemblies were given water and sanitation authority status without fiscal capacity, human resources, experience, and human capacity to discharge their responsibilities, another symptom of IWRM failure. In most countries, water resources are situated in rural areas, but people that reside close to these resources face scarcity because water is transported to urban centres and rural households are expected to use boreholes and shallow wells. Rural households situated next to the Akosombo Dam and the Mpira Dam are experiencing more water rationing, cut-offs and restrictions than their urban counterparts. The water scarcity in South Africa that led to the introduction of UD toilets is one of the setbacks to communities that paved the way for the construction of large dams such as the Inanda Dam. The pattern is global, and in most

instances dam-affected communities are the last group of impoverished people to benefit from access to water and adequate sanitation.

The new institutions which evolved as a result of IWRM implementation were hindered from actively participating in IWRM platforms in their jurisdictions, mainly as a result of unanticipated institutional and information costs. The constitutional right to water found in South Africa, Ghana, and Malawi is not translated into reducing water and sanitation scarcity. There is neither legislation nor service level standards in most countries that confirm sufficient subsidies indigent households to enjoy their constitutional rights to water and sanitation. Nor do water and environmental sanitation policies in Ghana and Malawi provide minimum service level standards. The progressive realisation of the water and sanitation rights enshrined in constitutions is generally meaningless. In South Africa, service level standards and the progressive realisation of water and sanitation rights are legislated, but the UD case study illustrates how when it comes to rural and peri-urban households, discrimination still occurs against a class of lower-income people who are provided with lower service level standards of sanitation. Their urban and middle class counterparts, meanwhile, enjoy much better service level standards.

IWRM's institutional shortcomings also include inadequate regulation of water provision. In most low-income African countries which adhere to IWRM, water service level charters fail to force service providers to operate and maintain water and sanitation resources within certain timeframes and to consult with households before tariff increases are effected. In most countries, water and sanitation bills are not delivered to households, and the contract between providers and users is often ignored. There is weak environmental and ecological regulation. Service providers in Ghana, Malawi and South Africa are not held accountable for discharging effluents into rivers, oceans, and other water sources. Inadequate benchmarks exist for managing waste water treatment plants by water authorities in Ghana, Malawi and South Africa. In rural areas in these countries, the operation and maintenance of boreholes and water points by households proved to be unsustainable.

In all these respects, the scarcity that rural households experience remains artificial: an economic scarcity associated with the institutions created by IWRM. In South Africa, water is regarded as a fundamental human right, and sanitation rights are implied in health and environmental rights. The fact that the eThekweni Municipality has used ecological sanitation as an entry point sounds politically correct as far as environmentalists are concerned, but ecological sanitation can only work if all classes (ranging from the poor to the middle class) use it. In these respects, the institutional forms meant to allow IWRM to work for all citizens and the environment, have the opposite consequences.

8.6 Conclusions

The conclusions drawn from this doctoral research follow from the critique of excessive commodification and inappropriate decentralisation of water. Can IWRM's many flaws be corrected? If so, institutional reforms will be just as important as necessary policy changes. And if so, changes in the implementation of IWRM should evolve from experiences of local institutions and should not be a policy condition imposed by external institutions. National ministries should continue to regulate service providers and set national standards for rural water supply and sanitation, but precisely how this should happen in future remains a matter that needs clarity. In most developing countries, national government institutions have withdrawn prematurely while their services were still required at the local level. Local government institutions were artificially established through promulgating national laws, but the establishment of durable, effective municipal state institutions remains a challenge apparently beyond the capacity of IWRM advocates. The establishment of water and sanitation departments within local authorities should have been dealt with prior to devolving water and sanitation responsibilities to municipal or CMA institutions. Prior to the implementation of IWRM, most African countries had ineffectual water and sanitation systems in rural areas. But the imported IWRM solutions, such as creating environments for private sector participation which would result in Built Own Operate Transfer systems and community management, did not work because no private sector water supplier has been able to make profits in Africa's rural areas.

These are some of the difficult lessons of IWRM implementation. Recognising water as an economic good alongside reducing subsidies eventually resulted in a truncated form of community management. These are two of the strategies in IWRM implementation that failed to deliver the desired results: managing water at the lowest levels possible. The IWRM efficiency plans adopted in Ghana and Malawi require reform, in order to align them with the realities of decentralised national ministries and fragile local authorities. In another example of inappropriate scale alignment, the question arises as to whether watershed management is an alternative to river basin management, since the latter does not seem to be working in water supply and sanitation programmes. The water and sanitation abundance that Shiva (2002) advocates requires the application of local knowledges about water. To that end, social movements and civil society organisations often regard water and sanitation as ‘commons’ and ecological goods managed at a watershed level. Through their intervention, there might be a full-fledged overhaul of IWRM that can contribute towards a shift from scarcity to abundance. Civil society’s success in rolling back the most extreme forms of water commodification – full-fledged urban privatisation of water in high-profile sites ranging from Cochabamba, Bolivia, to Atlanta and Detroit, from Johannesburg to most Argentine cities, to Manila – offer grounds for optimism, even if the replacement is not yet a satisfactory system of IWRM that serves the lowest-income people.

In this thesis I conclude that the implementation of IWRM in Ghana, Malawi and South Africa caused damage that exceeded the anticipated positive results. Institutions associated with IWRM implementation began to realise that basin level and trans-boundary water resource management problems were not easily applicable to water supply and sanitation subsectors. It is important that local actors are truly empowered – including possession of sufficient financial resources – to take decisions about water management at the lowest levels possible because of the local need to do so, and not because it is a requirement from the African Development Bank. Water and sanitation scarcity in Africa has worsened because of imported institutional arrangements skewed in favour of non-existent markets at the expense of the rural poor. It is the responsibility of

each of the 54 African countries to begin to drive their own development agendas without prescriptions from ideologically-biased donors. This requires taking stock of the lessons from IWRM implementation that plunged Africa into water and sanitation scarcity; a scarcity that is manufactured and generated by a development ideology that emerged elsewhere. A free and empowered Africa is still possible.

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